PUBLIC REVIEW DRAFT

SUPPLEMENTAL INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION - APPENDICES

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

HAYWARD MAINTENANCE COMPLEX PHASE 2 PROJECT

SCH # 2010122013

June 2022

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HAYWARD MAINTENANCE COMPLEX PHASE 2 PROJECT

SCH # 2010122013

Submitted to:

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Oakland, California 94612

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June 2022

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APPENDIX A

2011 MITIGATION MONITORING AND REPORTING PLAN

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For Consideration by BART Board on May 26, 2011

Hayward Maintenance Complex Project Mitigation Monitoring and Reporting Plan

San Francisco Bay Area Rapid Transit District
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Section 1
Introduction

1.1 PURPOSE AND NEED FOR MONITORING

Pursuant to the California Environmental Quality Act (CEQA), an Initial Study/Mitigated Negative Declaration (IS/MND) was prepared by the San Francisco Bay Area Rapid Transit District (BART) to address the potential environmental effects of the Hayward Maintenance Complex (HMC) Project (proposed project). The Draft IS/MND was issued for a public review period that began on December 3, 2010 and ended on February 11, 2011. A Final IS/MND has been prepared that provides all comments on the proposed project and responds to those comments. The environmental analyses for the proposed project identified potential impacts and measures to mitigate those impacts wherever feasible. Impacts and mitigation measures were identified in the following areas:

- Visual Quality
- Air Quality
- Biological Resources
- Cultural Resources
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise and Vibration
- Transportation/Traffic

This Mitigation Monitoring and Reporting Plan (MMRP) identifies the mitigation actions that will be performed by BART to compensate for, reduce, minimize, or eliminate the effect of impacts resulting from construction and operation of the proposed project. The MMRP was prepared pursuant to the requirements of California Public Resources Code Section 21081.6, which requires a public agency to adopt a monitoring and/or reporting program to ensure compliance with mitigation measures during project implementation. This MMRP identifies and clarifies the mitigation measures to be implemented by BART for the proposed project and identifies the parties responsible for implementation and monitoring. This MMRP incorporates all mitigation measures identified.

1.2 PROJECT DESCRIPTION

The San Francisco Bay Area Rapid Transit District (BART) operates and maintains 104 miles of track in revenue service and 43 stations, serving an average of 360,000 passenger trips every weekday in the counties of San Francisco, Alameda, Contra Costa, and San Mateo. The Hayward Yard is one of four

BART maintenance facilities serving the BART system. Over the next 30 years, BART will require additional vehicles to meet future demand associated with regional population growth, system expansions for the Warm Springs and Silicon Valley/San Jose Extension projects, and additional riders from the Oakland Airport Connector and eBART projects. Accordingly, BART requires expanded maintenance and storage facilities to serve the expanded fleet. The proposed Hayward Maintenance Complex project (proposed project) would consist of acquisition and improvement to three properties on the west side of the existing Hayward Yard and the construction of additional storage tracks for a maximum of 250 vehicles on undeveloped BART property on the east side of the Hayward Yard.

1.3 MITIGATION MONITORING PROGRAM

This MMRP has been prepared for the Hayward Maintenance Complex Project in accordance with the California Public Resources Code Section 21081.6, which specifies that when a public agency makes findings required by paragraph (1) of subdivision (a) of Section 21081, it "…shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment." Public Resources Code 21081.6 further specifies that the MMRP will "…ensure compliance during project implementation." This MMRP is intended to ensure the effective implementation of mitigation measures that are within the authority of BART to implement, including monitoring where identified, throughout all phases of development and operation of the Project.

1.4 MITIGATION ACTIONS

The HMC Project Manager will be responsible for oversight of mitigation actions and reporting on compliance with the measures in this plan. Mitigation actions will be performed by BART staff, by consultants to BART, and/or by contractors to BART.

1.5 PROCEDURES FOR MONITORING AND REPORTING

Monitoring and reporting procedures will conform to the following steps prior to and during project construction and operations.

Step 1 – Monitoring

This step will be executed by the Monitor, who will be designated by the Transit System Development Project Manager (PM). Monitoring activities may be performed by BART staff or the Monitor may be a consultant or contractor to BART. The Monitor shall report to the PM and shall perform monitoring and reporting tasks in consultation, as needed, with the BART System Safety Department Manager and other BART staff with relevant expertise.

The Monitor will have the following responsibilities:

- Prepare an implementation plan prior to the commencement of construction to augment and detail the monitoring actions and compliance requirements listed in this MMRP.
- Be knowledgeable in the mitigation that is to be monitored.
- Verify implementation of mitigation by:
  - ensuring prior to advertisement for contract bids that bid documents, contracts, and other plans and specifications include requirements to implement identified mitigation measures;
  - conducting site visits in the field to ensure that required implementation has been properly executed during and after construction; and
  - contacting the Project Manager and requesting that the situation be remedied if mitigation is not being implemented or executed properly. This action will be accomplished with formal notification via an Environmental Non Conformance Report (ENCR) process, which requires formal response.
- Prepare Mitigation Status Forms and submit to appropriate BART management.

Step 2 – Action

This step will be executed by the PM. The PM will be appointed by the Executive Manager of TSD.

The PM will have the following responsibilities:

- Review the Mitigation Status Forms and any other information presented by the Monitor as monitoring occurs.
- Review and approve any amendments to the MMRP that may be proposed by the Monitor, BART staff or contractors. The MMRP may be amended if changes in monitoring activities are deemed necessary, so long as such changes provide equivalent mitigation measures and maintain conformance with goals of the plan.
- Coordinate with other BART Divisions, as necessary.
- Ensure that the mitigation measures in the MMRP are undertaken, via staff, contractors, or consultants.
- Ensure that penalties to contractors for noncompliance and for ongoing noncompliance are incorporated into contracts.
- Verify monthly that mitigation actions are properly undertaken. This may include designation of a BART staff person or consultant to enforce effective and timely compliance with regard to specific mitigation measures outlined in this MMRP or required permits.
- Ensure that procedures and assignments to implement the MMRP are in place in the event that the BART structure is reorganized prior to completion of the MMRP actions.

Step 3 – Reporting

This step will be executed by the Monitor.

The Monitor will have the following responsibilities:

- Convey the status and any recommendations to the PM. Recommendations may include updating the frequency of monitoring, changing the type of monitoring, and suggesting better ways to implement mitigation.
- Assist the PM in reviewing contractor's response to ENCRs, and preparing details of corrective action and time of completion to resolve the issues. If the Monitor deems mitigation is satisfactorily completed, the noncompliance situation will expire. If the Monitor deems mitigation to be unsatisfactorily addressed, Monitor will document the non-compliance in a report. The reports will be submitted to the PM and the General Manager or the General Manager's designee.
- Verify that the ENCR is enforced, that the contractor has taken corrective action and submitted a formal response to the ENCR, and the contractor will incur appropriate penalties as specified in the contracts. The Monitor will report corrective actions taken to remedy noncompliance or ongoing noncompliance to the PM and the General Manager or the General Manager's designee.
- Report to the PM on MMRP issues on a monthly basis.
- Compile all Mitigation Status Forms into a Compliance Report on a quarterly basis.
- Submit Compliance Reports through the PM to the General Manager or the General Manager's designee every 12 months.

1.6 GENERAL MITIGATION AND MONITORING EFFORTS

In general, BART staff will be responsible for implementing or ensuring that the mitigation actions listed in the MMRP are undertaken for this project. Mitigation measures may be implemented by BART staff, consultants to BART, and/or by the contractors who will construct the proposed project under the oversight of BART staff. Implementation includes ensuring that any required actions are included in bid documents and contracts as part of the design and construction process for the proposed project and ensuring that the consultants and contractors include specified mitigation activities in plans and specifications for construction. BART staff responsibility includes designation of certain mitigation responsibility to, and continued oversight of, the contractors and consultants.

The Monitor will investigate noncompliance allegations and identify how BART staff or its designees, contractors, or consultants should correct implementation of the measure. The recipient of the ENCR has 30 days to respond with plans for corrective action, unless another timeframe is required by state or federal regulatory agencies or as specified in contracts. Otherwise, BART staff is responsible for enforcing contracts to bring ENCRs into conformance; contractors or consultants are responsible for

correcting actions in nonconformance, as indicated in contracts. If a measure is under control of another agency, the Monitor will inform the agency of the Monitor's determination and request improved implementation. All actions taken as part of this MMRP will be documented and reported to the PM monthly, Compliance Reports generated quarterly, and reported every twelve months to the General Manager or the General Manager's designee. This MMRP will be available for public review at the HMC Project office, currently at 300 Lakeside Drive, Oakland, California 94612. For the extent of the mitigation monitoring period, as listed in each mitigation measure, individuals and public agencies may notify the Monitor in writing if mitigation measures are not implemented or being executed properly.

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Section 2
Project Mitigation Measures

2.1 INTRODUCTION

This section describes the mitigation measures for each of the impacts identified in the Hayward Maintenance Complex IS/MND and identifies the parties responsible for implementation and monitoring of each measure. Mitigation measures are numbered using a prefix to link them with the impact they address. ("Mitigation Measure TR-1" refers to the first mitigation measure identified in the Transportation section.) For ease of reference, the impacts and mitigation measures in this MMRP are numbered as they were described in the environmental analysis. The resource topics are discussed in the same order as presented in the IS/MND.

2.2 PROJECT MITIGATION MEASURES

The following impacts and mitigation measures apply to the proposed project.

Visual Quality

Visual Character. Construction of the proposed crossover switches south of Whipple Road could require the removal of trees to the west of the BART mainline to provide track access. These trees currently screen views from residents east of the BART mainline toward the existing industrial buildings to the west. The removal of these trees could alter views from the residential area and increase the visibility of the industrial uses to the west; this would be a potentially significant impact of the project.

Mitigation Measure VQ-1 Replacement of Trees that Screen Views of Industrial Buildings. If construction activities south of Whipple Road require removal of the existing trees near the industrial buildings west of the BART mainline, BART shall plant replacement trees at a 1:1 ratio in the area of removal, after construction activities are complete.

Monitoring:

1. Prior to construction of the proposed project, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications include all requirements to plant replacement trees at a 1:1 ratio.

2. The Monitor will verify in the field that the BART contractor is replacing all removed trees at the ratio identified in the IS/MND.

Air Quality

Construction NO_x. There would be a potential for an exceedance of the NO_x threshold if the clearing, grubbing, grading, and fill transport activities planned for Phase 2 of the proposed project are conducted simultaneously with other project construction activities.

Mitigation Measure AQ-1 Construction Phasing to Reduce Air Emissions. For construction of the storage tracks in Phase 2, BART shall ensure that all work involving clearing, grubbing, grading, and fill transport associated with work on the project site north of Whipple Road not be conducted concurrently with construction work south of Whipple Road to assure that the BAAQMD NO_x construction equipment emission threshold would not be exceeded.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications incorporate the requirements set forth in Mitigation Measure AQ-1 above.

2. During construction, the Monitor will verify in the field that the BART contractor is conducting construction activities according to the requirements set forth in Mitigation Measure AQ-1 above.

Construction Dust. PM_{10} and $PM_{2.5}$ would be generated from soil-disturbing activities. These dust emissions could impact sensitive residential receptors to the north, northeast, and east of the project site by increasing local ambient PM_{10} concentrations there.

Mitigation Measure AQ-2 Dust Control during Construction. BART shall ensure implementation of the following mitigation measures during project construction, in accordance with Bay Area Air Quality Management District (BAAQMD) standard mitigation requirements:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day, or as necessary to control dust.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as practical.
- Building pads shall be laid as soon as practical after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control

measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage stating the regulations shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications incorporate the requirements set forth in the list above and require that the contractor use control measures set forth by the BAAQMD for construction activities to minimize fugitive dust.

2. During construction, the Monitor will verify in the field that the BART contractor is implementing the BAAQMD air quality construction control measures to minimize air emissions according to the plans and specifications.

Biological Resources

Wetland Disturbances. Construction and operation of the proposed project may result in the filling or adverse modification of jurisdictional wetlands, other "waters of the U.S.," or "waters of the State."

Mitigation Measure BIO-1 Wetland Avoidance and Protection. BART shall ensure that the wetlands adjacent to the east side expansion area of the project site are not affected during construction by installing orange exclusionary fence to alert construction crews that the areas are to be avoided during construction, and through compliance with applicable statewide NPDES general permits.

In addition, BART shall ensure that post installation conditions shall not cause significant changes to the pre-project hydrology, water quality, or water quantity in any wetland or other water of the U.S. that is affected by the project. This shall be accomplished through implementation of Mitigation Measures HYD-1 and HYD-2 from the Hydrology section, *Stormwater Drainage System Design*, and through compliance with applicable statewide NPDES general permits.

Monitoring:

1. Prior to approval of the final design of the proposed project, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications incorporate the above requirements to mitigate impacts to wetlands, other "waters of the U.S.," or "waters of the State," and that the applicable NPDES permit will be obtained.

2. BART staff will ensure and the Monitor will verify that BART retains a qualified biologist to confirm that the proposed project will not impact wetlands, "waters of the U.S.," or "waters of the State," and that the applicable NPDES permit has been obtained.

Nesting Habitat. Trees and shrubs found within both the east side and west side expansion areas could provide nesting habitat for a wide variety of native birds. Removal of these trees and shrubs during the nesting season (March 1 to September 15) could result in the loss of active bird nests, the loss of which would be a significant impact.

Mitigation Measure BIO-2 Restrictions on Tree or Shrub Removal to Avoid Nesting Birds. Tree or shrub removal or pruning shall be avoided from March 1 through September 15, the bird nesting period, to the extent feasible. If no tree or shrub removal or pruning is proposed during the nesting period, no surveys or further mitigation measures are required.

Monitoring:

1. Prior to construction, BART staff will ensure and the Monitor will verify that plan specifications and construction bid documents include restrictions on tree and shrub removal during the bird nesting period to the extent feasible.

Mitigation Measure BIO-3 Pre-construction Nesting Bird Survey and Measures to Reduce Harm to Nesting Birds. If tree and shrub removal is unavoidable during the nesting season, BART shall hire a qualified biologist to conduct a survey for nesting raptors and other birds covered by the Migratory Bird Treaty Act (MBTA). BART shall have a qualified biologist conduct nest surveys no more than 30 days prior to any demolition/construction or ground-disturbing activities that are within 500 feet of potential nest trees or suitable nesting habitat (i.e., trees, tule, cattails, grassland). A pre-construction survey report shall be submitted to CDFG that includes, at a minimum: (1) a description of the methodology including dates of field visits, the names of survey personnel with resumes, and a list of references cited and persons contacted; and (2) a map showing the location(s) of any bird nests observed on the project site. If no active nests of MBTA-covered species are identified, then no further mitigation is required.

If active nests of protected bird species are identified in the focused nest surveys, BART will consult with the appropriate regulatory agencies to identify project-level mitigation requirements, based on the agencies standards and policies as then in effect. Mitigation may include the following, based on current agency standards and policies:

a) BART, in consultation with CDFG, would delay construction in the vicinity of active nest sites during the breeding season (March 1 through September 15) while the nest is occupied with adults and/or young. A qualified biologist would monitor any occupied nest to determine when the nest is no longer used. If the construction cannot be delayed, avoidance measures would include the establishment of a non-disturbance buffer zone around the nest site. The size of the buffer zone would be determined in consultation with the CDFG, but will be a minimum of 100 feet. The buffer zone would be delineated with highly visible temporary construction fencing.

b) No intensive disturbance (e.g., heavy equipment operation associated with construction, or use of cranes) or other project-related activities that could cause nest abandonment or forced fledging would be initiated within the established buffer zone of an active nest between March 1 and September 15.

c) If construction activities are unavoidable within the buffer zone, BART would retain a qualified biologist to monitor the nest site to determine if construction activities are disturbing the adult or young birds. If abandonment occurs, the biologist would consult with CDFG or USFWS (who monitor compliance with the MBTA) for the appropriate salvage measures (e.g., remove abandoned nestlings to an agency approved wildlife care group). BART would be required to fund the full costs of the salvage measures.

d) If fully protected species are found to be nesting near the construction area, their nests would be completely avoided until the birds fledge. Avoidance would include the establishment of a non-disturbance buffer zone of 250 feet, or as determined in consultation with the CDFG.

Monitoring:

1. Prior to construction, BART staff will ensure and the Monitor will verify that bid documents, contracts, and other plans and specifications require a preconstruction survey for nesting raptors and other birds covered by the MBTA to be conducted 30 days prior to the initiation of any ground-disturbing or vegetation clearing activities that occur between March 1 and September 15, as described above.

2. BART staff will ensure and the Monitor will verify that BART, in consultation with CDFG, will retain a qualified biologist to conduct the preconstruction survey.

3. If no active nests of MBTA-covered species are identified, then no further mitigation is required.

4. If active nests of protected bird species are identified in the focused nest surveys, BART will ensure and the Monitor will verify that the appropriate regulatory agencies are consulted to identify project-level mitigation requirements, based on the agencies' standards and policies as then in effect.

Protected Trees. Removal of coast redwood trees, considered protected trees under the City of Hayward's Tree Preservation Ordinance, located in the west side expansion area would constitute a significant impact.

Mitigation Measure BIO-4 Tree Survey and Replacement of Protected Trees to be Removed. Prior to construction, BART shall retain a certified arborist to survey trees in the project area, including potential access roads and staging areas, to identify and evaluate trees that shall be removed. A report shall be prepared and submitted to BART to document the trees that are to be removed. Mitigation shall be required for impacts to trees designated as "protected trees" in the cities of Hayward or Union City. Replacement trees will be a native tree species. Each removed tree

meeting the above classifications will be replaced at a 1:1 ratio. Trees will be planted in locations suitable for the replacement species. Selection of the replacement sites and installation of replacement plantings will be supervised by a qualified botanist. Trees will be replaced as soon as practical after construction is completed. A qualified botanist will monitor newly planted trees at least once a year for 5 years. Each year during that period, any trees that do not survive will be replaced. Any trees planted as remediation for failed plantings will be planted as stipulated here for original plantings, and will be monitored for a period of 5 years following installation.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that a tree survey is conducted by a certified arborist to identify and evaluate trees that shall be removed, including identification of "protected trees" in the cities of Hayward or Union City.

2. BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications require that replacement trees be planted to compensate for removal of any specially-designated tree.

3. The Monitor will verify in the field that the tree replacement plan is implemented and that the replacement plantings are supervised by a qualified botanist.

4. Monitor will verify that replacement trees are monitored for 5 years and failed plantings are replaced.

Cultural Resources

Archaeological Resources. If any prehistoric resources are located subsurface within the project area, project-related ground-disturbing activities could potentially cause a significant impact to those resources.

Mitigation Measure CR-1 Avoidance of Discovered Cultural Resources and Measures to Reduce Harm. If evidence of an archaeological site or other suspected historic resource is encountered during construction, including darkened soil representing past human activity ("midden") that could conceal material remains (e.g., worked stone, faunal bone, hearths, or storage pit), all ground-disturbing activity within 100 feet of the find shall be halted and BART notified. BART will hire an archaeologist meeting the Secretary of the Interior's Standards for Professional Archaeologist to assess the find. Impacts to any significant resources may be mitigated through avoidance, data recovery, or other methods determined adequate by the qualified archaeologist and that are consistent with the Secretary of the Interior's Standards for Archeological Documentation. Any mitigation plan developed by the qualified archaeologist shall be approved by BART prior to implementation. Project-related ground-disturbing activities shall not be continued in the vicinity of any discovered resource until the significance of the resource is resolved and mitigation action (if any) is completed.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications include provisions for the response to the discovery of archeological artifacts.

2. If unknown potential historical or unique archaeological resources are discovered during construction, BART staff will ensure and the monitor will verify that all work in the immediate vicinity be suspended and alteration of the materials and their context shall be avoided pending site investigation by a qualified archaeologist.

3. BART staff will ensure and the Monitor will verify that, if a historical or unique archeological site is identified, BART will retain a qualified archeologist to develop and implement a plan for investigation and avoidance, if feasible.

Human Remains. Project-related ground-disturbing activities (in both the west side and east side portions of the project site) could disturb or destroy any human remains that are present within the project area, causing a significant impact.

Mitigation Measure CR-2 Avoidance of Discovered Human Remains and Measures to Reduce Harm. If human remains, including disarticulated or cremated remains, are discovered during any phase of construction, all ground-disturbing activities in the vicinity and Hayward any nearby area reasonably suspected to overlie adjacent human remains shall be immediately halted. BART and the Alameda County Coroner shall be notified immediately, according to Section 5097.98 of the State Public Resources Code and Section 7050.05 of California's Health and Safety Code. If the remains are determined by the county coroner to be Native American, it is the responsibility of the county coroner to inform the Native American Heritage Commission (NAHC) within 24 hours. The guidelines of the NAHC should be adhered to in the treatment and disposition of the remains. BART shall retain a qualified archaeologist who meets the Secretary of the Interior's Standards for Professional Archaeologist and with Native American burial experience to conduct a field investigation of the specific site and consult with the person identified as the Most Likely Descendent, if any, identified by the NAHC. BART shall approve any mitigation recommended by the qualified archaeologist prior to implementation, taking account of the provisions of State law as set forth in the California Environmental Quality Act (CEQA) Guidelines Section 15064.5(e) and Public Resources Code Section 5097.98. Approved mitigation must be implemented before resumption of ground disturbing activities in the vicinity of where the remains were discovered.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications include all requirements that if human remains are discovered, construction shall cease and follow protocol and procedures, as described above.

2. The Monitor will verify in the field that protocol and procedures are being implemented.

Greenhouse Gas Emissions

Construction GHG Emissions. Construction of the proposed project would generate short-term GHG emissions.

Mitigation Measure GHG-1 Construction-Related Greenhouse Gas Best Management Practices. BART shall ensure implementation of the following mitigation measures during project construction, in accordance with Bay Area Air Quality Management District (BAAQMD) standard mitigation recommendations which suggest:

- Use alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment for at least 15 percent of the fleet;
- Use local building materials (within 100 miles) of at least 10 percent; and
- Recycle or reuse at least 50 percent of construction waste or demolition materials.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications incorporate the requirements set forth in the list above and require that the contractor use mitigation measures set forth by the BAAQMD for construction activities to minimize GHG emissions.

2. During construction, the Monitor will verify in the field that the BART contractor is implementing the BAAQMD standard mitigation measures to minimize GHG emissions according to the plans and specifications.

Hazards and Hazardous Materials

Hazardous Materials. Construction of the proposed project could potentially expose workers and employees to contaminated materials, resulting in a significant impact.

Mitigation Measure HAZ-1 File Review and a Phase I ESA Prior to Construction. Prior to construction BART shall conduct an environmental site assessment (ESA) to further analyze potential hazardous materials and waste sites around the project site. BART shall ensure that additional research, including a file review with the Alameda County Department of

Environmental Health and the RWQCB and a Phase I ESA for the west side expansion area, is performed. If the file review reveals no potential impact from environmental contamination, no further action to remedy soil or groundwater contamination would be necessary.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that an additional file review and a Phase I ESA are conducted, as described above.

Mitigation Measure HAZ-2 Further Soil and Groundwater Investigations Prior to any Construction Activities. If the file review under Mitigation Measure HAZ-1 above reveals potential environmental contamination along or beneath the proposed project's footprint or other facilities, BART shall evaluate the sites to determine the level of investigation appropriate to evaluate the possible presence of hazardous chemicals in soil and groundwater. In the event soil and/or groundwater testing is deemed appropriate, BART shall ensure that a Phase II soil and groundwater investigation is conducted in the affected areas, including field sampling and laboratory analysis, to evaluate conditions where excavation and grading will take place. The Phase II investigation shall be completed prior to any construction or excavation work, and a schedule shall be developed in the pre-design phase of the project to ensure that a sufficient amount of time is allotted prior to site development to identify and implement actions to investigate the presence of hazardous substances in soil and groundwater, and to identify design and contingency measures in the event that the results of the investigation indicate the need for further testing, site controls, or remediation. The number, location of field samples, and constituents tested would depend on the size of the impacted site, site activities, and possible transport or migration routes. Field samples may include soil, soil gas, or groundwater, depending on the nature of the contaminants suspected to be present. The sampling plan shall specify that all soil and groundwater chemical analyses shall be performed by a California certified laboratory, using standard EPA and California chemical testing methods. The investigation results shall, if necessary, lead to preparation of a:

- Remedial Action Plan for soil and groundwater treatment and disposal;
- Health and Safety Risk Assessment; and
- Soil management plan with criteria for impacted soils, in consultation with DTSC and RWQCB.

If necessary, a Remedial Action Plan shall be prepared to identify options for remediation of the contaminated site. If the proposed remedial approach does not involve complete source removal, a Health and Safety Risk Assessment shall be completed. Work in impacted areas will be conducted in accordance with applicable Cal OSHA requirements.

Monitoring:

1. If contaminated sites are found, BART staff will ensure and the Monitor will verify that further soil and groundwater investigations are conducted, and if necessary, a Remedial

Action Plan, a Health and Safety Risk Assessment, and a soil management plan will be prepared prior to construction activities.

2. During project construction, the Monitor will inspect and verify in the field that the BART contractor is adhering to the Remedial Action Plan, the Health and Safety Risk Assessment, and the soil management plan.

Mitigation Measure HAZ-3 Remediation of Contaminated Sites Prior to Construction. If hazardous materials are identified in soil and groundwater at levels that present a risk to the public, to construction workers, or to the environment, based on the investigations described in Mitigation Measure HAZ-2 above, BART shall ensure that remediation is conducted at contaminated sites pursuant to applicable laws and regulations.

A Remedial Action Plan may be developed if warranted to address potential air and health impacts from soil excavation activities, potential transportation impacts from the removal of remedial activities, and potential risks of public upset should there be an accident at excavation sites. During excavation activities, construction workers or the public may be exposed to contaminants in the soil through ingestion, dermal contact, inhalation of fugitive dust, and inhalation of volatile emissions. The Site-Specific Health and Safety Plan will include measures to mitigate these potential impacts, such as cordoning off excavation sites to prevent public access, water misting to control dust during removal activities, perimeter air monitoring for dust along the site boundaries both upwind and immediately downwind of site excavation and stockpiling activities, and air monitoring of volatile organic compounds (VOC). All exposed contaminated materials shall be covered at the end of each day. Excavation work shall be performed in compliance with all OSHA rules and regulations.

Monitoring:

1. If hazardous materials are identified in soil and groundwater at levels that present a risk, BART staff will ensure and the Monitor will verify that remediation is conducted at contaminated sites pursuant to applicable laws and regulations.

2. During project construction, the Monitor will inspect and verify in the field that the BART contractor is conducting remediation pursuant to applicable laws and regulations.

Mitigation Measure HAZ-4 Discovered Environmental Contamination During Construction. In the event that soil, groundwater, or other environmental medium with suspected contamination is encountered unexpectedly during construction activities after implementation of Mitigation Measure HAZ-3, BART's contractor shall cease work in the vicinity of the suspect material, the area shall be secured as necessary, and contractor shall take all appropriate measures to protect human health and the environment. Appropriate measures shall include notification of the applicable regulatory agency(ies) as necessary, to identify the nature and extent of contamination. Work shall not resume in the area(s) affected until the measures have been implemented under the oversight of the corresponding regulatory agency(ies), as appropriate.

Monitoring:

1. If hazardous materials are identified in soil, or other environmental medium unexpectedly during construction activities, BART staff will ensure and the Monitor will verify that all construction activities shall cease until all measures identified above have been implemented under the applicable oversight agency(ies).

Hydrology and Water Quality

On-Site Drainage Pattern. The proposed project could result in off-site and on-site flooding as a result of an increased impervious surface cover at the project site.

Mitigation Measure HYD-1 Stormwater Drainage System Design. Prior to final design of each phase of the proposed project, BART shall have a licensed professional engineer registered in California prepare a detailed Hydrology and Hydraulics Report that identifies flow contributing areas (catchments), flow pathways, off-site discharge locations, receiving storm drain systems, and proposed on-site flow conveyance structures and conveyance capacities.

The Hydrology and Hydraulics Report shall identify the off-site peak flow rates and flow volumes for the 100-year storm event at all proposed off-site discharge locations, retained existing on-site flow conveyance structures, and proposed onsite flow conveyance structures for both existing conditions and proposed project conditions. The detailed Hydrology and Hydraulics Report calculations shall be prepared in accordance with Alameda County Flood Control District Hydrology and Hydraulics Manual (June 2003, or later version, as applicable).

Off-site Runoff. Based on the detailed Hydrology and Hydraulics Report, BART shall design on-site detention (or retention) facilities sufficient to detain increases in 100-year runoff peak flow rates and retain increases in 100-year flow volumes at all off-site discharge locations compared to existing conditions. BART shall submit a preliminary design, along with the Hydrology and Hydraulics Report, to the Alameda Flood Control District and City of Hayward Public Works Department for review. BART shall incorporate Alameda Flood Control District recommendations into the project design, where applicable, prior to the beginning of construction activities.

On-site Runoff. BART shall design on-site drainage in accordance with one of the following, or a combination of the following:

- BART shall design sufficient on-site detention (or retention) to detain increase in flow rates in excess of the conveyance capacity of existing downstream structures; or
- BART shall upgrade existing on-site conveyance structures to provide sufficient conveyance capacity. All proposed on-site conveyance structures shall be designed with adequate capacity to convey the 100-year storm event.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications require that the contractor develop a detailed Hydrology and Hydraulics Report and incorporate recommendations of the report into the project design. In addition, BART contractors shall incorporate Alameda Flood Control District recommendations into the project design, where applicable.

2. BART staff will ensure and the Monitor will verify that prior to construction activities, a preliminary design, along with the Hydrology and Hydraulics Report is submitted to the Alameda Flood Control District and City of Hayward Publics Works Department for review.

Noise and Vibration

Noise. Operation and construction of the proposed project would result in significant noise impacts to residents adjacent to the project site.

Mitigation Measure NO-1 Construction of Sound Walls. BART shall incorporate sound walls at the BART right-of-way line or other locations that mitigate the noise impacts indicated in Table 13 and Table 14 of the IS/MND. Implementation of sound walls will provide approximately 10 dBA reduction in overall noise levels. Concrete block masonry, poured-in-place, or pre-cast concrete walls would be acceptable as construction materials provided they have a minimum surface density of 4 lbs/ft2. The specific location of sound walls will be addressed in final design. Sound walls will be constructed in phases as necessary to reduce noise as components of the project are constructed.

Monitoring:

1. Prior to final design plans, BART staff will ensure and the Monitor will verify that the recommended noise attenuation measures would satisfy the standards defined by the Federal Transit Administration.

2. BART staff will ensure and the Monitor will verify that the plan specifications and construction bid documents include the recommended noise attenuation measures that would reduce train noise so that noise levels indicated in Table 13 and Table 14 of the IS/MND are not exceeded.

Mitigation Measure NO-2 Installation of Building Sound Insulation Features. For those receptors where the outdoor wayside noise from the train operations at ground level can be mitigated to achieve the FTA criteria, but the sound walls provided by Mitigation Measure NO-1 are not sufficient to mitigate noise levels at upper stories, BART will measure operational noise levels on a case-by-case basis following project implementation. Where the existing building construction

does not provide interior noise levels of Ldn 45 dBA or lower, BART will quantitatively evaluate individual structures and implement a formal program of building sound insulation improvement as necessary to meet this criterion.

Monitoring:

1. Following project implementation, BART staff will ensure and the Monitor will verify that a quantitative analysis of individual residences is conducted on a case-by-case basis to determine if the recommended noise attenuation measures would satisfy the standards defined by the Federal Transit Administration.

2. Where sound walls provided by Mitigation Measure NO-1 are not sufficient to mitigate noise for the upper stories, as determined under Monitoring Item 1 above, BART staff will ensure and the Monitor will verify that a formal program of building sound insulation improvements is implemented, as necessary, in order to meet the FTA criterion.

Mitigation Measure NO-3 Construction Noise Best Management Practices. BART shall incorporate the following practices into the construction documents to be implemented by the project contractor. Such practices include, but are not limited to, the following measures:

- Where feasible, BART shall require that the contractor complies with a Performance Standard of 80 dBA 8-hour Leq during the daytime (7 a.m. to 10 p.m.) and 70 dBA 8-hour Leq during the nighttime (10 p.m. to 7 a.m.) at the property line of the sensitive receptor.

- Prior to construction, BART shall ensure that a Noise Control and Monitoring Report is prepared. The report shall include expected construction noise levels, noise control measures, and explain how the contractor intends to monitor and document construction noise and complaints.

- Locate noisy equipment as far as possible from noise sensitive receptors. In addition, the use of temporary barriers should be employed around the equipment.

- Where construction noise impacts have been identified, use temporary noise barriers along the working area and/or project right-of-way. Barriers/curtains must achieve a Sound Transmission Class (STC) of 30 or greater in accordance with ASTM Test Method E90 and be constructed from material having a surface density of at least 4 pounds/square foot, to ensure adequate transmission loss.

- When nighttime or 24-hour construction will be required, coordinate with residents to ensure that the affected residents are fully informed about the upcoming construction. Residents will be given the option of sleeping in hotel rooms at BART expense for the duration of the nighttime construction in areas where construction is expected to exceed the FTA criterion. Residents that work nights and sleep days in locations where construction noise is expected to exceed the FTA criterion will be given the same option.

- Require ambient sensitive ("smart") backup alarms, SAE Class D, or limit to SAE Class C (97 dB) for vehicles over 2.5 cubic yards haulage capacity, or Cal-OSHA/DOSH-approved methods that avoid backup alarm noise for vehicles under 2.5 cubic yards haulage capacity.
- Fit silencers to combustion engines. Ensure that equipment has effective, quality mufflers installed, in good working condition.
- Switch off engines or reduce to idle when not in use.
- Lubricate and maintain equipment regularly.
- Route construction-related truck traffic along roadways that result in the least disturbance to sensitive receptors.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications include requirements to use noise-reducing construction practices and to measure noise levels before beginning construction and periodically during construction, as described above.

2. BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications include requirements for the use of noise barriers between equipment and residential areas, as listed above, to meet BART's construction noise thresholds in the vicinity of sensitive receptors.

3. During project construction, the Monitor will verify through periodic spot checks in the field that all noise-reduction measures as described above are used to reduce noise near sensitive receptors, and that the construction noise criteria are met.

Vibration. Operation and construction of the proposed project would result in significant vibration impacts to residents adjacent to the project site.

Mitigation Measure NO-4 Vibration Reducing Technology. BART shall incorporate vibration mitigation measures such as tire-derived aggregate (TDA) or floating slab track (FST) under the track, or other technology that may be developed to attain the FTA groundborne vibration operational criterion of 72 VdB. The general location of the mitigation measures under the track is presented in Table 22. However, the actual extent of the mitigation control would be determined during final design.

Table 22
Vibration Mitigation

Crossover #	Mitigation Required for Phase 1	Mitigation Required for Phase 2
P100B	No	Yes[1]
P100	No	No
P101	No	Yes [1]
P102	Yes[1]	No
P103	No	No
P104	No	No

Source: WIA 2010

Notes:

1. Mitigation extent will be determined during final design.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications include requirements to incorporate vibration-reducing technologies in the final project design.

2. During project construction, the Monitor will inspect and verify in the field that the BART contractor is incorporating the vibration-reducing technologies identified in the final project design.

Mitigation Measure NO-5 Construction Vibration Best Management Practices. Where potential construction vibration impacts have been identified, the contractor shall be required to select equipment and methods that would reduce potential annoyance to nearby residents. Such practices include, but are not limited to, the following measures:

- Comply with a Performance Standard of 0.3 in/sec PPV at any building at anytime.
- Minimize vibration annoyance by maintaining vibration levels at 80 VdB or less at any building at any time.
- Prior to construction, BART shall prepare a Vibration Control and Monitoring Report, in which the contractor indicates what vibration levels they expect to generate, vibration control measures they intend to implement, and how they intend to monitor and document construction vibration and complaints.
- Avoid the use of impact pile drivers, and use instead sonic or vibratory impact drivers. It is also encouraged that “quiet” or “silent” piling technologies be used, if feasible.
- When nighttime or 24-hour construction is necessary, coordinate with residents to ensure that the affected residents are fully informed about the upcoming construction. Residents will be given the option of sleeping in hotel rooms at BART expense for the duration of the nighttime

construction in areas where construction is expected to exceed the FTA criterion. Residents that work nights and sleep days in locations where construction vibration is expected to exceed the FTA criterion will be given the same option.

- Monitor vibration during construction to ensure compliance with the criterion for building damage for buildings within 40 feet from construction activities. Conduct a pre-construction crack survey at these structures.
- Plan routes for hauling material out of the project site that would cause the least impact (annoyance).
- Restrict high amplitude vibration methods such as vibratory pile driving and soil compaction using large truck-mounted compactors to areas beyond 50 feet and 20 feet, respectively, of residential structures or wood-framed buildings. Otherwise, temporary accommodations away from construction shall be coordinated between BART and the residents.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications include requirements for the contractor to use vibration-reducing practices and construction methods, as described above.

2. During project construction, the Monitor will verify through periodic spot checks in the field that appropriate vibration-reducing techniques are used and that BART's noise and vibration criteria are met.

Transportation/Traffic

Construction-Related Traffic Impacts. Construction of the proposed project could result in construction-related traffic impacts that would be potentially significant.

Mitigation Measure TR-1 Construction Phasing and Traffic Management Plan. BART will ensure that a Construction Phasing and Traffic Management Plan is developed and implemented by the contractor. The plan shall define how traffic operations, including construction equipment and worker traffic, are managed and maintained during each phase of construction. The plan shall be developed in consultation with the cities of Union City and Hayward, BART, and Union City Transit Bus Lines. To the maximum practical extent, the plan shall include the following measures:

a) Specify predetermined haul routes from staging areas to construction sites and disposal areas by agreement with the cities of Union City and Hayward prior to construction. The routes shall follow streets and highways that provide the safest route and avoid congested intersections to the extent feasible.

b) Identify construction activities that, due to concerns regarding traffic safety or congestion, must take place during off-peak hours.

c) Identify a telephone number that the public can call for information on construction scheduling, phasing, and duration, as well as for complaints. Such information shall also be posted on BART's website.

Monitoring:

1. Prior to project construction, BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications include a requirement that the contractor develop and implement a construction phasing and traffic management plan, as described above.

2. BART staff will ensure coordination with the cities of Union City and Hayward, BART, and Union City Transit Bus Lines, in developing and implementing the construction phasing and traffic management plan.

3. The Monitor will verify that the construction phasing and traffic management plan is being properly implemented in the field.

Traffic Safety. The proposed project may need reconfiguration at the intersection of Whipple Road in order to mitigate sight distance safety hazards, which would constitute as a significant impact.

Mitigation Measure TR-2 Reconfiguration of Southbound Approach of the West Side Expansion Area Driveway. BART will reconfigure the approach to Whipple Road for the west side expansion area driveway by narrowing the mouth of the intersection and channeling southbound traffic to approach Whipple Road at a more perpendicular angle. In addition, shrubbery/vegetation that impedes vehicle line of sight to the east will be removed.

Monitoring:

1. Prior to project operation, BART staff will ensure that an appropriate driveway design will be implemented as described above.

2. BART staff will ensure and the Monitor will verify that bid documents and contracts, and other plans and specifications include the intersection modifications required to implement the mitigation measures.

3. The Monitor will verify in the field that, the intersections modifications are being constructed according to the construction plans.

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APPENDIX B

AIR QUALITY MODELING RESULTS

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BART Hayward Maintenance Complex Phase 2

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-Rail	5.80	1000sqft	0.13	5,800.00	0
Other Asphalt Surfaces	6.00	Acre	5.87	261,360.00	0
Other Non-Asphalt Surfaces	10.00	Acre	10.00	435,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2028
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

BART Hayward Maintenance Complex Phase 2 - Alameda County, Annual

Project Characteristics - CO2 intensity based on 5-year average (PG&E 2015)

Land Use - The Phase 2 project site consists of approximately 16 acres of undeveloped land in the northeast quadrant of the HMC property. The northernmost 6 acres of the Phase 2 area would be developed as the site of the Northern Mainline Connector.

Construction Phase - Based on Construction Scenario as described in the Project Description.

Off-road Equipment - Default grading equipment.

Off-road Equipment - Default Grading Equipment.

Off-road Equipment - Default grading equipment

Off-road Equipment - Default paving equipment.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Trips and VMT - Based on Construction Scenario as described in the Project Description.

Grading - Based on Construction Scenario as described in the Project Description.

Vehicle Trips - The proposed project would not generate new vehicle trips.

Energy Use - Based on energy usage provided to LSA.

Construction Off-road Equipment Mitigation - Assuming compliance with BAAQMD Basic Construction Mitigation Measures.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	300.00	165.00
tblConstructionPhase	NumDays	300.00	100.00
tblConstructionPhase	NumDays	300.00	60.00
tblConstructionPhase	NumDays	300.00	60.00
tblConstructionPhase	NumDays	30.00	110.00
tblConstructionPhase	NumDays	30.00	305.00

BART Hayward Maintenance Complex Phase 2 - Alameda County, Annual

tblConstructionPhase	NumDays	30.00	20.00
tblConstructionPhase	NumDays	20.00	30.00
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tblEnergyUse	NT24E	1.38	18.80
tblEnergyUse	NT24NG	0.21	0.00
tblEnergyUse	T24E	0.24	3.00
tblEnergyUse	T24NG	1.18	0.00
tblGrading	AcresOfGrading	412.50	16.00
tblGrading	AcresOfGrading	1,143.75	16.00
tblGrading	AcresOfGrading	75.00	16.00
tblGrading	MaterialImported	0.00	84,700.00
tblGrading	MaterialImported	0.00	5,800.00
tblGrading	MaterialImported	0.00	3,150.00
tblLandUse	LotAcreage	6.00	5.87
tblOffRoadEquipment	HorsePower	402.00	46.00
tblOffRoadEquipment	LoadFactor	0.38	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
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tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
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tblOffRoadEquipment	UsageHours	8.00	12.00

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tblOffRoadEquipment	UsageHours	7.00	12.00
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tblOffRoadEquipment	UsageHours	8.00	12.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblTripsAndVMT	HaulingTripNumber	10,588.00	11,300.00
tblTripsAndVMT	HaulingTripNumber	0.00	160.00
tblTripsAndVMT	HaulingTripNumber	0.00	142.00
tblTripsAndVMT	HaulingTripNumber	0.00	652.00
tblTripsAndVMT	HaulingTripNumber	0.00	360.00
tblTripsAndVMT	HaulingTripNumber	725.00	800.00
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tblTripsAndVMT	WorkerTripNumber	20.00	80.00
tblVehicleTrips	ST_TR	1.68	0.00

tblVehicleTrips	SU_TR	1.68	0.00
tblVehicleTrips	WD_TR	1.68	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.2969	3.5047	2.5385	9.3200e-003	0.6254	0.1089	0.7344	0.3024	0.1003	0.4027	0.0000	854.7779	854.7779	0.1588	0.0000	858.7476
2025	0.3468	2.9685	3.3148	8.2600e-003	0.1891	0.1188	0.3079	0.0509	0.1121	0.1629	0.0000	724.1631	724.1631	0.1532	0.0000	727.9940
2026	0.9213	7.8614	8.0724	0.0207	0.9814	0.3148	1.2962	0.5082	0.2945	0.8027	0.0000	1,813.9960	1,813.9960	0.4696	0.0000	1,825.7353
2027	0.7747	6.4097	6.4915	0.0180	0.7001	0.2517	0.9518	0.3514	0.2351	0.5865	0.0000	1,572.5235	1,572.5235	0.4163	0.0000	1,582.9299
Maximum	**0.9213**	**7.8614**	**8.0724**	**0.0207**	**0.9814**	**0.3148**	**1.2962**	**0.5082**	**0.2945**	**0.8027**	**0.0000**	**1,813.9960**	**1,813.9960**	**0.4696**	**0.0000**	**1,825.7353**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.2969	3.5047	2.5385	9.3200e-003	0.3523	0.1089	0.4613	0.1554	0.1003	0.2557	0.0000	854.7774	854.7774	0.1588	0.0000	858.7471
2025	0.3468	2.9684	3.3148	8.2600e-003	0.1743	0.1188	0.2931	0.0459	0.1121	0.1579	0.0000	724.1624	724.1624	0.1532	0.0000	727.9932
2026	0.9213	7.8614	8.0724	0.0207	0.4947	0.3148	0.8095	0.2428	0.2945	0.5373	0.0000	1,813.9940	1,813.9940	0.4696	0.0000	1,825.7332
2027	0.7747	6.4097	6.4915	0.0180	0.3651	0.2517	0.6168	0.1714	0.2351	0.4065	0.0000	1,572.5218	1,572.5218	0.4163	0.0000	1,582.9281
Maximum	**0.9213**	**7.8614**	**8.0724**	**0.0207**	**0.4947**	**0.3148**	**0.8095**	**0.2428**	**0.2945**	**0.5373**	**0.0000**	**1,813.9940**	**1,813.9940**	**0.4696**	**0.0000**	**1,825.7332**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**44.46**	**0.00**	**33.73**	**49.25**	**0.00**	**30.56**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**8-5-2024**	**11-4-2024**	2.3303	2.3303
2	**11-5-2024**	**2-4-2025**	1.8403	1.8403
3	**2-5-2025**	**5-4-2025**	0.8410	0.8410
4	**5-5-2025**	**8-4-2025**	0.8750	0.8750
5	**8-5-2025**	**11-4-2025**	0.7645	0.7645
6	**11-5-2025**	**2-4-2026**	0.5940	0.5940
7	**2-5-2026**	**5-4-2026**	1.2213	1.2213
8	**5-5-2026**	**8-4-2026**	2.7754	2.7754

9	**8-5-2026**	**11-4-2026**	2.7759	2.7759
10	**11-5-2026**	**2-4-2027**	2.7763	2.7763
11	**2-5-2027**	**5-4-2027**	2.6848	2.6848
12	**5-5-2027**	**8-4-2027**	1.5834	1.5834
13	**8-5-2027**	**9-30-2027**	0.6538	0.6538
		Highest	2.7763	2.7763

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0853	0.0000	2.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.9000e-004	3.9000e-004	0.0000	0.0000	4.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	44.8080	44.8080	3.9500e-003	8.2000e-004	45.1504
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	1.1063	0.0000	1.1063	0.0654	0.0000	2.7408
Water						0.0000	0.0000		0.0000	0.0000	0.4255	1.0824	1.5079	0.0438	1.0500e-003	2.9163
Total	**0.0853**	**0.0000**	**2.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.5318**	**45.8908**	**47.4226**	**0.1131**	**1.8700e-003**	**50.8080**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0853	0.0000	2.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.9000e-004	3.9000e-004	0.0000	0.0000	4.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	44.8080	44.8080	3.9500e-003	8.2000e-004	45.1504
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	1.1063	0.0000	1.1063	0.0654	0.0000	2.7408
Water						0.0000	0.0000		0.0000	0.0000	0.4255	1.0824	1.5079	0.0438	1.0500e-003	2.9163
Total	**0.0853**	**0.0000**	**2.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.5318**	**45.8908**	**47.4226**	**0.1131**	**1.8700e-003**	**50.8080**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Clearing, Grubbing, and Site Grading	Grading	8/5/2024	1/3/2025	5	110	
2	Installation of Underground Stormwater Storage	Trenching	1/6/2025	2/14/2025	5	30	
3	Installation of Industrial Parkway Structure	Building Construction	2/17/2025	10/3/2025	5	165	
4	Installation of Retaining Walls	Building Construction	10/6/2025	2/20/2026	5	100	
5	Installation of Access Roadway and Cart Paths	Paving	2/23/2026	4/3/2026	5	30	
6	Installation of Trackwork	Grading	4/6/2026	6/4/2027	5	305	
7	Installation of Gap Breaker Stations	Building Construction	6/7/2027	8/27/2027	5	60	
8	Installation of Train Control House	Building Construction	8/30/2027	11/19/2027	5	60	
9	Bio Retention Basin	Grading	11/22/2027	12/17/2027	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 15.87

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Clearing, Grubbing, and Site Grading	Excavators	2	12.00	158	0.38
Clearing, Grubbing, and Site Grading	Graders	1	12.00	187	0.41
Clearing, Grubbing, and Site Grading	Rubber Tired Dozers	1	12.00	247	0.40
Clearing, Grubbing, and Site Grading	Scrapers	2	12.00	367	0.48
Clearing, Grubbing, and Site Grading	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Underground Stormwater Storage	Cranes	2	12.00	231	0.29

Installation of Underground Stormwater Storage	Excavators	2	12.00	158	0.38
Installation of Underground Stormwater Storage	Off-Highway Trucks	2	12.00	402	0.38
Installation of Underground Stormwater Storage	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Industrial Parkway Structure	Air Compressors	1	12.00	78	0.48
Installation of Industrial Parkway Structure	Cement and Mortar Mixers	1	12.00	9	0.56
Installation of Industrial Parkway Structure	Cranes	2	12.00	231	0.29
Installation of Industrial Parkway Structure	Forklifts	0	8.00	89	0.20
Installation of Industrial Parkway Structure	Generator Sets	1	12.00	84	0.74
Installation of Industrial Parkway Structure	Off-Highway Trucks	2	12.00	46	0.45
Installation of Industrial Parkway Structure	Pumps	1	12.00	84	0.74
Installation of Industrial Parkway Structure	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Industrial Parkway Structure	Welders	0	8.00	46	0.45
Installation of Retaining Walls	Bore/Drill Rigs	2	12.00	221	0.50
Installation of Retaining Walls	Cranes	2	12.00	231	0.29
Installation of Retaining Walls	Forklifts	0	8.00	89	0.20
Installation of Retaining Walls	Generator Sets	0	8.00	84	0.74
Installation of Retaining Walls	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Installation of Retaining Walls	Welders	0	8.00	46	0.45
Installation of Access Roadway and Cart Paths	Pavers	2	12.00	130	0.42
Installation of Access Roadway and Cart Paths	Paving Equipment	2	12.00	132	0.36
Installation of Access Roadway and Cart Paths	Rollers	2	12.00	80	0.38
Installation of Trackwork	Air Compressors	1	12.00	78	0.48
Installation of Trackwork	Cement and Mortar Mixers	1	12.00	9	0.56
Installation of Trackwork	Cranes	2	12.00	231	0.29

Installation of Trackwork	Dumpers/Tenders	2	12.00	16	0.38
Installation of Trackwork	Excavators	2	12.00	158	0.38
Installation of Trackwork	Generator Sets	1	12.00	84	0.74
Installation of Trackwork	Graders	1	12.00	187	0.41
Installation of Trackwork	Off-Highway Trucks	2	12.00	402	0.38
Installation of Trackwork	Pumps	2	12.00	84	0.74
Installation of Trackwork	Rubber Tired Dozers	1	12.00	247	0.40
Installation of Trackwork	Scrapers	2	12.00	367	0.48
Installation of Trackwork	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Gap Breaker Stations	Cranes	2	12.00	231	0.29
Installation of Gap Breaker Stations	Forklifts	0	8.00	89	0.20
Installation of Gap Breaker Stations	Generator Sets	0	8.00	84	0.74
Installation of Gap Breaker Stations	Off-Highway Trucks	4	12.00	402	0.38
Installation of Gap Breaker Stations	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Installation of Gap Breaker Stations	Welders	0	8.00	46	0.45
Installation of Train Control House	Cement and Mortar Mixers	1	12.00	9	0.56
Installation of Train Control House	Cranes	1	12.00	231	0.29
Installation of Train Control House	Dumpers/Tenders	1	12.00	16	0.38
Installation of Train Control House	Forklifts	0	8.00	89	0.20
Installation of Train Control House	Generator Sets	1	12.00	84	0.74
Installation of Train Control House	Graders	1	12.00	187	0.41
Installation of Train Control House	Off-Highway Trucks	2	12.00	402	0.38
Installation of Train Control House	Pumps	1	12.00	84	0.74
Installation of Train Control House	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Train Control House	Welders	0	8.00	46	0.45
Bio Retention Basin	Excavators	2	12.00	158	0.38
Bio Retention Basin	Graders	1	12.00	187	0.41

Bio Retention Basin	Rubber Tired Dozers	1	12.00	247	0.40
Bio Retention Basin	Scrapers	2	12.00	367	0.48
Bio Retention Basin	Tractors/Loaders/Backhoes	2	12.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Clearing, Grubbing, and Site Grading	8	80.00	0.00	11,300.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Underground Stormwa	8	80.00	0.00	160.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Industrial Parkway Str	10	80.00	0.00	142.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Retaining Walls	4	80.00	0.00	652.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Access Roadway and Cart Pat	6	80.00	0.00	360.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Trackwork	19	80.00	0.00	800.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Gap Breaker Stations	6	80.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Train Control House	10	80.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bio Retention Basin	8	80.00	0.00	700.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Clearing, Grubbing, and Site Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4966	0.0000	0.4966	0.2673	0.0000	0.2673	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2583	2.5983	2.2248	4.9800e-003		0.1072	0.1072		0.0986	0.0986	0.0000	437.5192	437.5192	0.1415	0.0000	441.0567
Total	**0.2583**	**2.5983**	**2.2248**	**4.9800e-003**	**0.4966**	**0.1072**	**0.6037**	**0.2673**	**0.0986**	**0.3659**	**0.0000**	**437.5192**	**437.5192**	**0.1415**	**0.0000**	**441.0567**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0276	0.8994	0.2348	4.0500e-003	0.0951	1.5600e-003	0.0966	0.0261	1.4900e-003	0.0276	0.0000	391.4151	391.4151	0.0168	0.0000	391.8347
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0111	7.0500e-003	0.0789	2.9000e-004	0.0338	2.1000e-004	0.0341	9.0000e-003	2.0000e-004	9.2000e-003	0.0000	25.8436	25.8436	5.0000e-004	0.0000	25.8561
Total	**0.0387**	**0.9065**	**0.3137**	**4.3400e-003**	**0.1289**	**1.7700e-003**	**0.1307**	**0.0351**	**1.6900e-003**	**0.0368**	**0.0000**	**417.2588**	**417.2588**	**0.0173**	**0.0000**	**417.6909**

3.2 Clearing, Grubbing, and Site Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2235	0.0000	0.2235	0.1203	0.0000	0.1203	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2583	2.5983	2.2248	4.9800e-003		0.1072	0.1072		0.0986	0.0986	0.0000	437.5187	437.5187	0.1415	0.0000	441.0562
Total	**0.2583**	**2.5983**	**2.2248**	**4.9800e-003**	**0.2235**	**0.1072**	**0.3306**	**0.1203**	**0.0986**	**0.2189**	**0.0000**	**437.5187**	**437.5187**	**0.1415**	**0.0000**	**441.0562**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0276	0.8994	0.2348	4.0500e-003	0.0951	1.5600e-003	0.0966	0.0261	1.4900e-003	0.0276	0.0000	391.4151	391.4151	0.0168	0.0000	391.8347
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0111	7.0500e-003	0.0789	2.9000e-004	0.0338	2.1000e-004	0.0341	9.0000e-003	2.0000e-004	9.2000e-003	0.0000	25.8436	25.8436	5.0000e-004	0.0000	25.8561
Total	**0.0387**	**0.9065**	**0.3137**	**4.3400e-003**	**0.1289**	**1.7700e-003**	**0.1307**	**0.0351**	**1.6900e-003**	**0.0368**	**0.0000**	**417.2588**	**417.2588**	**0.0173**	**0.0000**	**417.6909**

3.2 Clearing, Grubbing, and Site Grading - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0268	0.0000	0.0268	9.0900e-003	0.0000	9.0900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5300e-003	0.0629	0.0592	1.4000e-004		2.5400e-003	2.5400e-003		2.3400e-003	2.3400e-003	0.0000	12.2639	12.2639	3.9700e-003	0.0000	12.3631
Total	**6.5300e-003**	**0.0629**	**0.0592**	**1.4000e-004**	**0.0268**	**2.5400e-003**	**0.0294**	**9.0900e-003**	**2.3400e-003**	**0.0114**	**0.0000**	**12.2639**	**12.2639**	**3.9700e-003**	**0.0000**	**12.3631**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.7000e-004	0.0248	6.5600e-003	1.1000e-004	0.0721	4.0000e-005	0.0722	0.0178	4.0000e-005	0.0178	0.0000	10.8972	10.8972	4.7000e-004	0.0000	10.9089
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.8000e-004	2.0400e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.5000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.6950	0.6950	1.0000e-005	0.0000	0.6953
Total	**1.0600e-003**	**0.0249**	**8.6000e-003**	**1.2000e-004**	**0.0731**	**5.0000e-005**	**0.0731**	**0.0180**	**5.0000e-005**	**0.0181**	**0.0000**	**11.5922**	**11.5922**	**4.8000e-004**	**0.0000**	**11.6042**

3.2 Clearing, Grubbing, and Site Grading - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0121	0.0000	0.0121	4.0900e-003	0.0000	4.0900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5300e-003	0.0629	0.0592	1.4000e-004		2.5400e-003	2.5400e-003		2.3400e-003	2.3400e-003	0.0000	12.2639	12.2639	3.9700e-003	0.0000	12.3630
Total	**6.5300e-003**	**0.0629**	**0.0592**	**1.4000e-004**	**0.0121**	**2.5400e-003**	**0.0146**	**4.0900e-003**	**2.3400e-003**	**6.4300e-003**	**0.0000**	**12.2639**	**12.2639**	**3.9700e-003**	**0.0000**	**12.3630**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.7000e-004	0.0248	6.5600e-003	1.1000e-004	0.0721	4.0000e-005	0.0722	0.0178	4.0000e-005	0.0178	0.0000	10.8972	10.8972	4.7000e-004	0.0000	10.9089
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.8000e-004	2.0400e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.5000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.6950	0.6950	1.0000e-005	0.0000	0.6953
Total	**1.0600e-003**	**0.0249**	**8.6000e-003**	**1.2000e-004**	**0.0731**	**5.0000e-005**	**0.0731**	**0.0180**	**5.0000e-005**	**0.0181**	**0.0000**	**11.5922**	**11.5922**	**4.8000e-004**	**0.0000**	**11.6042**

3.3 Installation of Underground Stormwater Storage - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0490	0.3866	0.4685	1.2300e-003		0.0158	0.0158		0.0145	0.0145	0.0000	107.8101	107.8101	0.0349	0.0000	108.6818
Total	**0.0490**	**0.3866**	**0.4685**	**1.2300e-003**		**0.0158**	**0.0158**		**0.0145**	**0.0145**	**0.0000**	**107.8101**	**107.8101**	**0.0349**	**0.0000**	**108.6818**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-004	0.0129	3.4000e-003	6.0000e-005	1.3600e-003	2.0000e-005	1.3800e-003	3.7000e-004	2.0000e-005	3.9000e-004	0.0000	5.6575	5.6575	2.4000e-004	0.0000	5.6636
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9200e-003	1.7900e-003	0.0205	8.0000e-005	9.4900e-003	6.0000e-005	9.5500e-003	2.5200e-003	5.0000e-005	2.5800e-003	0.0000	6.9501	6.9501	1.3000e-004	0.0000	6.9532
Total	**3.3200e-003**	**0.0146**	**0.0239**	**1.4000e-004**	**0.0109**	**8.0000e-005**	**0.0109**	**2.8900e-003**	**7.0000e-005**	**2.9700e-003**	**0.0000**	**12.6076**	**12.6076**	**3.7000e-004**	**0.0000**	**12.6169**

3.3 Installation of Underground Stormwater Storage - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0490	0.3866	0.4685	1.2300e-003		0.0158	0.0158		0.0145	0.0145	0.0000	107.8100	107.8100	0.0349	0.0000	108.6817
Total	**0.0490**	**0.3866**	**0.4685**	**1.2300e-003**		**0.0158**	**0.0158**		**0.0145**	**0.0145**	**0.0000**	**107.8100**	**107.8100**	**0.0349**	**0.0000**	**108.6817**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-004	0.0129	3.4000e-003	6.0000e-005	1.3600e-003	2.0000e-005	1.3800e-003	3.7000e-004	2.0000e-005	3.9000e-004	0.0000	5.6575	5.6575	2.4000e-004	0.0000	5.6636
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9200e-003	1.7900e-003	0.0205	8.0000e-005	9.4900e-003	6.0000e-005	9.5500e-003	2.5200e-003	5.0000e-005	2.5800e-003	0.0000	6.9501	6.9501	1.3000e-004	0.0000	6.9532
Total	**3.3200e-003**	**0.0146**	**0.0239**	**1.4000e-004**	**0.0109**	**8.0000e-005**	**0.0109**	**2.8900e-003**	**7.0000e-005**	**2.9700e-003**	**0.0000**	**12.6076**	**12.6076**	**3.7000e-004**	**0.0000**	**12.6169**

3.4 Installation of Industrial Parkway Structure - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2140	1.9457	2.2309	4.4100e-003		0.0813	0.0813		0.0775	0.0775	0.0000	380.9810	380.9810	0.0708	0.0000	382.7515
Total	**0.2140**	**1.9457**	**2.2309**	**4.4100e-003**		**0.0813**	**0.0813**		**0.0775**	**0.0775**	**0.0000**	**380.9810**	**380.9810**	**0.0708**	**0.0000**	**382.7515**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.5000e-004	0.0114	3.0200e-003	5.0000e-005	1.2000e-003	2.0000e-005	1.2200e-003	3.3000e-004	2.0000e-005	3.5000e-004	0.0000	5.0211	5.0211	2.2000e-004	0.0000	5.0265
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0160	9.8600e-003	0.1125	4.2000e-004	0.0522	3.2000e-004	0.0525	0.0139	3.0000e-004	0.0142	0.0000	38.2253	38.2253	7.0000e-004	0.0000	38.2427
Total	**0.0164**	**0.0213**	**0.1155**	**4.7000e-004**	**0.0534**	**3.4000e-004**	**0.0537**	**0.0142**	**3.2000e-004**	**0.0145**	**0.0000**	**43.2464**	**43.2464**	**9.2000e-004**	**0.0000**	**43.2692**

3.4 Installation of Industrial Parkway Structure - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2140	1.9457	2.2309	4.4100e-003		0.0813	0.0813		0.0775	0.0775	0.0000	380.9806	380.9806	0.0708	0.0000	382.7510
Total	**0.2140**	**1.9457**	**2.2309**	**4.4100e-003**		**0.0813**	**0.0813**		**0.0775**	**0.0775**	**0.0000**	**380.9806**	**380.9806**	**0.0708**	**0.0000**	**382.7510**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.5000e-004	0.0114	3.0200e-003	5.0000e-005	1.2000e-003	2.0000e-005	1.2200e-003	3.3000e-004	2.0000e-005	3.5000e-004	0.0000	5.0211	5.0211	2.2000e-004	0.0000	5.0265
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0160	9.8600e-003	0.1125	4.2000e-004	0.0522	3.2000e-004	0.0525	0.0139	3.0000e-004	0.0142	0.0000	38.2253	38.2253	7.0000e-004	0.0000	38.2427
Total	**0.0164**	**0.0213**	**0.1155**	**4.7000e-004**	**0.0534**	**3.4000e-004**	**0.0537**	**0.0142**	**3.2000e-004**	**0.0145**	**0.0000**	**43.2464**	**43.2464**	**9.2000e-004**	**0.0000**	**43.2692**

3.5 Installation of Retaining Walls - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0493	0.4757	0.3565	1.4400e-003		0.0185	0.0185		0.0170	0.0170	0.0000	126.5425	126.5425	0.0409	0.0000	127.5657
Total	**0.0493**	**0.4757**	**0.3565**	**1.4400e-003**		**0.0185**	**0.0185**		**0.0170**	**0.0170**	**0.0000**	**126.5425**	**126.5425**	**0.0409**	**0.0000**	**127.5657**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0200e-003	0.0330	8.7400e-003	1.5000e-004	5.0100e-003	6.0000e-005	5.0600e-003	1.3300e-003	5.0000e-005	1.3900e-003	0.0000	14.5243	14.5243	6.2000e-004	0.0000	14.5400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1300e-003	3.7700e-003	0.0429	1.6000e-004	0.0199	1.2000e-004	0.0201	5.3000e-003	1.1000e-004	5.4100e-003	0.0000	14.5951	14.5951	2.7000e-004	0.0000	14.6018
Total	**7.1500e-003**	**0.0368**	**0.0517**	**3.1000e-004**	**0.0249**	**1.8000e-004**	**0.0251**	**6.6300e-003**	**1.6000e-004**	**6.8000e-003**	**0.0000**	**29.1194**	**29.1194**	**8.9000e-004**	**0.0000**	**29.1417**

3.5 Installation of Retaining Walls - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0493	0.4757	0.3565	1.4400e-003		0.0185	0.0185		0.0170	0.0170	0.0000	126.5423	126.5423	0.0409	0.0000	127.5655
Total	**0.0493**	**0.4757**	**0.3565**	**1.4400e-003**		**0.0185**	**0.0185**		**0.0170**	**0.0170**	**0.0000**	**126.5423**	**126.5423**	**0.0409**	**0.0000**	**127.5655**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0200e-003	0.0330	8.7400e-003	1.5000e-004	5.0100e-003	6.0000e-005	5.0600e-003	1.3300e-003	5.0000e-005	1.3900e-003	0.0000	14.5243	14.5243	6.2000e-004	0.0000	14.5400
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1300e-003	3.7700e-003	0.0429	1.6000e-004	0.0199	1.2000e-004	0.0201	5.3000e-003	1.1000e-004	5.4100e-003	0.0000	14.5951	14.5951	2.7000e-004	0.0000	14.6018
Total	**7.1500e-003**	**0.0368**	**0.0517**	**3.1000e-004**	**0.0249**	**1.8000e-004**	**0.0251**	**6.6300e-003**	**1.6000e-004**	**6.8000e-003**	**0.0000**	**29.1194**	**29.1194**	**8.9000e-004**	**0.0000**	**29.1417**

3.5 Installation of Retaining Walls - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0290	0.2794	0.2094	8.5000e-004		0.0109	0.0109		0.0100	0.0100	0.0000	74.3186	74.3186	0.0240	0.0000	74.9195
Total	**0.0290**	**0.2794**	**0.2094**	**8.5000e-004**		**0.0109**	**0.0109**		**0.0100**	**0.0100**	**0.0000**	**74.3186**	**74.3186**	**0.0240**	**0.0000**	**74.9195**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-004	0.0190	5.1100e-003	9.0000e-005	4.6400e-003	3.0000e-005	4.6700e-003	1.2000e-003	3.0000e-005	1.2300e-003	0.0000	8.4762	8.4762	3.7000e-004	0.0000	8.4853
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4100e-003	2.0200e-003	0.0235	9.0000e-005	0.0117	7.0000e-005	0.0118	3.1100e-003	6.0000e-005	3.1800e-003	0.0000	8.2528	8.2528	1.4000e-004	0.0000	8.2563
Total	**4.0100e-003**	**0.0211**	**0.0286**	**1.8000e-004**	**0.0163**	**1.0000e-004**	**0.0164**	**4.3100e-003**	**9.0000e-005**	**4.4100e-003**	**0.0000**	**16.7289**	**16.7289**	**5.1000e-004**	**0.0000**	**16.7416**

3.5 Installation of Retaining Walls - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0290	0.2794	0.2094	8.5000e-004		0.0109	0.0109		0.0100	0.0100	0.0000	74.3185	74.3185	0.0240	0.0000	74.9194
Total	**0.0290**	**0.2794**	**0.2094**	**8.5000e-004**		**0.0109**	**0.0109**		**0.0100**	**0.0100**	**0.0000**	**74.3185**	**74.3185**	**0.0240**	**0.0000**	**74.9194**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.0000e-004	0.0190	5.1100e-003	9.0000e-005	4.6400e-003	3.0000e-005	4.6700e-003	1.2000e-003	3.0000e-005	1.2300e-003	0.0000	8.4762	8.4762	3.7000e-004	0.0000	8.4853
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4100e-003	2.0200e-003	0.0235	9.0000e-005	0.0117	7.0000e-005	0.0118	3.1100e-003	6.0000e-005	3.1800e-003	0.0000	8.2528	8.2528	1.4000e-004	0.0000	8.2563
Total	**4.0100e-003**	**0.0211**	**0.0286**	**1.8000e-004**	**0.0163**	**1.0000e-004**	**0.0164**	**4.3100e-003**	**9.0000e-005**	**4.4100e-003**	**0.0000**	**16.7289**	**16.7289**	**5.1000e-004**	**0.0000**	**16.7416**

3.6 Installation of Access Roadway and Cart Paths - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0206	0.1931	0.3280	5.1000e-004		9.4200e-003	9.4200e-003		8.6600e-003	8.6600e-003	0.0000	45.0433	45.0433	0.0146	0.0000	45.4075
Paving	7.6900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0283**	**0.1931**	**0.3280**	**5.1000e-004**		**9.4200e-003**	**9.4200e-003**		**8.6600e-003**	**8.6600e-003**	**0.0000**	**45.0433**	**45.0433**	**0.0146**	**0.0000**	**45.4075**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.9000e-004	0.0284	7.6300e-003	1.3000e-004	3.0500e-003	5.0000e-005	3.1000e-003	8.4000e-004	5.0000e-005	8.9000e-004	0.0000	12.6489	12.6489	5.5000e-004	0.0000	12.6626
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7600e-003	1.6400e-003	0.0190	7.0000e-005	9.4900e-003	6.0000e-005	9.5400e-003	2.5200e-003	5.0000e-005	2.5800e-003	0.0000	6.6914	6.6914	1.2000e-004	0.0000	6.6943
Total	**3.6500e-003**	**0.0301**	**0.0267**	**2.0000e-004**	**0.0125**	**1.1000e-004**	**0.0126**	**3.3600e-003**	**1.0000e-004**	**3.4700e-003**	**0.0000**	**19.3403**	**19.3403**	**6.7000e-004**	**0.0000**	**19.3569**

3.6 Installation of Access Roadway and Cart Paths - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0206	0.1931	0.3280	5.1000e-004		9.4200e-003	9.4200e-003		8.6600e-003	8.6600e-003	0.0000	45.0433	45.0433	0.0146	0.0000	45.4075
Paving	7.6900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0283**	**0.1931**	**0.3280**	**5.1000e-004**		**9.4200e-003**	**9.4200e-003**		**8.6600e-003**	**8.6600e-003**	**0.0000**	**45.0433**	**45.0433**	**0.0146**	**0.0000**	**45.4075**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.9000e-004	0.0284	7.6300e-003	1.3000e-004	3.0500e-003	5.0000e-005	3.1000e-003	8.4000e-004	5.0000e-005	8.9000e-004	0.0000	12.6489	12.6489	5.5000e-004	0.0000	12.6626
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7600e-003	1.6400e-003	0.0190	7.0000e-005	9.4900e-003	6.0000e-005	9.5400e-003	2.5200e-003	5.0000e-005	2.5800e-003	0.0000	6.6914	6.6914	1.2000e-004	0.0000	6.6943
Total	**3.6500e-003**	**0.0301**	**0.0267**	**2.0000e-004**	**0.0125**	**1.1000e-004**	**0.0126**	**3.3600e-003**	**1.0000e-004**	**3.4700e-003**	**0.0000**	**19.3403**	**19.3403**	**6.7000e-004**	**0.0000**	**19.3569**

3.7 Installation of Trackwork - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8850	0.0000	0.8850	0.4826	0.0000	0.4826	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8372	7.2871	7.3459	0.0183		0.2939	0.2939		0.2752	0.2752	0.0000	1,597.4146	1,597.4146	0.4283	0.0000	1,608.1217
Total	**0.8372**	**7.2871**	**7.3459**	**0.0183**	**0.8850**	**0.2939**	**1.1789**	**0.4826**	**0.2752**	**0.7578**	**0.0000**	**1,597.4146**	**1,597.4146**	**0.4283**	**0.0000**	**1,608.1217**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2600e-003	0.0402	0.0108	1.8000e-004	6.1500e-003	7.0000e-005	6.2200e-003	1.6400e-003	7.0000e-005	1.7100e-003	0.0000	17.8790	17.8790	7.7000e-004	0.0000	17.8982
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0179	0.0106	0.1230	4.8000e-004	0.0614	3.7000e-004	0.0617	0.0163	3.4000e-004	0.0167	0.0000	43.2712	43.2712	7.5000e-004	0.0000	43.2899
Total	**0.0191**	**0.0508**	**0.1338**	**6.6000e-004**	**0.0675**	**4.4000e-004**	**0.0679**	**0.0180**	**4.1000e-004**	**0.0184**	**0.0000**	**61.1502**	**61.1502**	**1.5200e-003**	**0.0000**	**61.1881**

3.7 Installation of Trackwork - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3983	0.0000	0.3983	0.2172	0.0000	0.2172	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.8372	7.2871	7.3459	0.0183		0.2939	0.2939		0.2752	0.2752	0.0000	1,597.4127	1,597.4127	0.4283	0.0000	1,608.1197
Total	**0.8372**	**7.2871**	**7.3459**	**0.0183**	**0.3983**	**0.2939**	**0.6921**	**0.2172**	**0.2752**	**0.4924**	**0.0000**	**1,597.4127**	**1,597.4127**	**0.4283**	**0.0000**	**1,608.1197**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.2600e-003	0.0402	0.0108	1.8000e-004	6.1500e-003	7.0000e-005	6.2200e-003	1.6400e-003	7.0000e-005	1.7100e-003	0.0000	17.8790	17.8790	7.7000e-004	0.0000	17.8982
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0179	0.0106	0.1230	4.8000e-004	0.0614	3.7000e-004	0.0617	0.0163	3.4000e-004	0.0167	0.0000	43.2712	43.2712	7.5000e-004	0.0000	43.2899
Total	**0.0191**	**0.0508**	**0.1338**	**6.6000e-004**	**0.0675**	**4.4000e-004**	**0.0679**	**0.0180**	**4.1000e-004**	**0.0184**	**0.0000**	**61.1502**	**61.1502**	**1.5200e-003**	**0.0000**	**61.1881**

3.7 Installation of Trackwork - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5102	0.0000	0.5102	0.2765	0.0000	0.2765	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4790	4.1694	4.2031	0.0105		0.1681	0.1681		0.1575	0.1575	0.0000	913.9847	913.9847	0.2451	0.0000	920.1108
Total	**0.4790**	**4.1694**	**4.2031**	**0.0105**	**0.5102**	**0.1681**	**0.6783**	**0.2765**	**0.1575**	**0.4340**	**0.0000**	**913.9847**	**913.9847**	**0.2451**	**0.0000**	**920.1108**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.1000e-004	0.0226	6.1600e-003	1.1000e-004	5.6900e-003	4.0000e-005	5.7200e-003	1.4700e-003	4.0000e-005	1.5100e-003	0.0000	10.1691	10.1691	4.4000e-004	0.0000	10.1801
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6600e-003	5.5500e-003	0.0657	2.6000e-004	0.0351	2.0000e-004	0.0353	9.3400e-003	1.8000e-004	9.5200e-003	0.0000	23.9074	23.9074	3.9000e-004	0.0000	23.9172
Total	**0.0104**	**0.0281**	**0.0719**	**3.7000e-004**	**0.0408**	**2.4000e-004**	**0.0410**	**0.0108**	**2.2000e-004**	**0.0110**	**0.0000**	**34.0765**	**34.0765**	**8.3000e-004**	**0.0000**	**34.0972**

3.7 Installation of Trackwork - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2296	0.0000	0.2296	0.1244	0.0000	0.1244	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4790	4.1694	4.2031	0.0105		0.1681	0.1681		0.1575	0.1575	0.0000	913.9836	913.9836	0.2451	0.0000	920.1097
Total	**0.4790**	**4.1694**	**4.2031**	**0.0105**	**0.2296**	**0.1681**	**0.3977**	**0.1244**	**0.1575**	**0.2819**	**0.0000**	**913.9836**	**913.9836**	**0.2451**	**0.0000**	**920.1097**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.1000e-004	0.0226	6.1600e-003	1.1000e-004	5.6900e-003	4.0000e-005	5.7200e-003	1.4700e-003	4.0000e-005	1.5100e-003	0.0000	10.1691	10.1691	4.4000e-004	0.0000	10.1801
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6600e-003	5.5500e-003	0.0657	2.6000e-004	0.0351	2.0000e-004	0.0353	9.3400e-003	1.8000e-004	9.5200e-003	0.0000	23.9074	23.9074	3.9000e-004	0.0000	23.9172
Total	**0.0104**	**0.0281**	**0.0719**	**3.7000e-004**	**0.0408**	**2.4000e-004**	**0.0410**	**0.0108**	**2.2000e-004**	**0.0110**	**0.0000**	**34.0765**	**34.0765**	**8.3000e-004**	**0.0000**	**34.0972**

3.8 Installation of Gap Breaker Stations - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1141	0.8010	0.7297	2.9000e-003		0.0306	0.0306		0.0281	0.0281	0.0000	254.5886	254.5886	0.0823	0.0000	256.6471
Total	**0.1141**	**0.8010**	**0.7297**	**2.9000e-003**		**0.0306**	**0.0306**		**0.0281**	**0.0281**	**0.0000**	**254.5886**	**254.5886**	**0.0823**	**0.0000**	**256.6471**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2200e-003	3.0000e-003	0.0355	1.4000e-004	0.0190	1.1000e-004	0.0191	5.0500e-003	1.0000e-004	5.1500e-003	0.0000	12.9229	12.9229	2.1000e-004	0.0000	12.9282
Total	**5.2200e-003**	**3.0000e-003**	**0.0355**	**1.4000e-004**	**0.0190**	**1.1000e-004**	**0.0191**	**5.0500e-003**	**1.0000e-004**	**5.1500e-003**	**0.0000**	**12.9229**	**12.9229**	**2.1000e-004**	**0.0000**	**12.9282**

3.8 Installation of Gap Breaker Stations - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1141	0.8010	0.7297	2.9000e-003		0.0306	0.0306		0.0281	0.0281	0.0000	254.5883	254.5883	0.0823	0.0000	256.6468
Total	**0.1141**	**0.8010**	**0.7297**	**2.9000e-003**		**0.0306**	**0.0306**		**0.0281**	**0.0281**	**0.0000**	**254.5883**	**254.5883**	**0.0823**	**0.0000**	**256.6468**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2200e-003	3.0000e-003	0.0355	1.4000e-004	0.0190	1.1000e-004	0.0191	5.0500e-003	1.0000e-004	5.1500e-003	0.0000	12.9229	12.9229	2.1000e-004	0.0000	12.9282
Total	**5.2200e-003**	**3.0000e-003**	**0.0355**	**1.4000e-004**	**0.0190**	**1.1000e-004**	**0.0191**	**5.0500e-003**	**1.0000e-004**	**5.1500e-003**	**0.0000**	**12.9229**	**12.9229**	**2.1000e-004**	**0.0000**	**12.9282**

3.9 Installation of Train Control House - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1138	0.9307	0.9943	2.6900e-003		0.0354	0.0354		0.0334	0.0334	0.0000	233.5116	233.5116	0.0601	0.0000	235.0128
Total	**0.1138**	**0.9307**	**0.9943**	**2.6900e-003**		**0.0354**	**0.0354**		**0.0334**	**0.0334**	**0.0000**	**233.5116**	**233.5116**	**0.0601**	**0.0000**	**235.0128**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2200e-003	3.0000e-003	0.0355	1.4000e-004	0.0190	1.1000e-004	0.0191	5.0500e-003	1.0000e-004	5.1500e-003	0.0000	12.9229	12.9229	2.1000e-004	0.0000	12.9282
Total	**5.2200e-003**	**3.0000e-003**	**0.0355**	**1.4000e-004**	**0.0190**	**1.1000e-004**	**0.0191**	**5.0500e-003**	**1.0000e-004**	**5.1500e-003**	**0.0000**	**12.9229**	**12.9229**	**2.1000e-004**	**0.0000**	**12.9282**

3.9 Installation of Train Control House - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1138	0.9307	0.9943	2.6900e-003		0.0354	0.0354		0.0334	0.0334	0.0000	233.5113	233.5113	0.0601	0.0000	235.0125
Total	**0.1138**	**0.9307**	**0.9943**	**2.6900e-003**		**0.0354**	**0.0354**		**0.0334**	**0.0334**	**0.0000**	**233.5113**	**233.5113**	**0.0601**	**0.0000**	**235.0125**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2200e-003	3.0000e-003	0.0355	1.4000e-004	0.0190	1.1000e-004	0.0191	5.0500e-003	1.0000e-004	5.1500e-003	0.0000	12.9229	12.9229	2.1000e-004	0.0000	12.9282
Total	**5.2200e-003**	**3.0000e-003**	**0.0355**	**1.4000e-004**	**0.0190**	**1.1000e-004**	**0.0191**	**5.0500e-003**	**1.0000e-004**	**5.1500e-003**	**0.0000**	**12.9229**	**12.9229**	**2.1000e-004**	**0.0000**	**12.9282**

3.10 Bio Retention Basin - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0990	0.0000	0.0990	0.0506	0.0000	0.0506	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0435	0.4191	0.3950	9.3000e-004		0.0170	0.0170		0.0156	0.0156	0.0000	81.7593	81.7593	0.0264	0.0000	82.4204
Total	**0.0435**	**0.4191**	**0.3950**	**9.3000e-004**	**0.0990**	**0.0170**	**0.1160**	**0.0506**	**0.0156**	**0.0662**	**0.0000**	**81.7593**	**81.7593**	**0.0264**	**0.0000**	**82.4204**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.7100e-003	0.0543	0.0148	2.5000e-004	5.9300e-003	9.0000e-005	6.0200e-003	1.6300e-003	9.0000e-005	1.7200e-003	0.0000	24.4493	24.4493	1.0600e-003	0.0000	24.4758
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7400e-003	1.0000e-003	0.0118	5.0000e-005	6.3300e-003	4.0000e-005	6.3600e-003	1.6800e-003	3.0000e-005	1.7200e-003	0.0000	4.3077	4.3077	7.0000e-005	0.0000	4.3094
Total	**3.4500e-003**	**0.0553**	**0.0266**	**3.0000e-004**	**0.0123**	**1.3000e-004**	**0.0124**	**3.3100e-003**	**1.2000e-004**	**3.4400e-003**	**0.0000**	**28.7570**	**28.7570**	**1.1300e-003**	**0.0000**	**28.7852**

3.10 Bio Retention Basin - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0446	0.0000	0.0446	0.0228	0.0000	0.0228	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0435	0.4191	0.3950	9.3000e-004		0.0170	0.0170		0.0156	0.0156	0.0000	81.7592	81.7592	0.0264	0.0000	82.4203
Total	**0.0435**	**0.4191**	**0.3950**	**9.3000e-004**	**0.0446**	**0.0170**	**0.0615**	**0.0228**	**0.0156**	**0.0384**	**0.0000**	**81.7592**	**81.7592**	**0.0264**	**0.0000**	**82.4203**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.7100e-003	0.0543	0.0148	2.5000e-004	5.9300e-003	9.0000e-005	6.0200e-003	1.6300e-003	9.0000e-005	1.7200e-003	0.0000	24.4493	24.4493	1.0600e-003	0.0000	24.4758
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7400e-003	1.0000e-003	0.0118	5.0000e-005	6.3300e-003	4.0000e-005	6.3600e-003	1.6800e-003	3.0000e-005	1.7200e-003	0.0000	4.3077	4.3077	7.0000e-005	0.0000	4.3094
Total	**3.4500e-003**	**0.0553**	**0.0266**	**3.0000e-004**	**0.0123**	**1.3000e-004**	**0.0124**	**3.3100e-003**	**1.2000e-004**	**3.4400e-003**	**0.0000**	**28.7570**	**28.7570**	**1.1300e-003**	**0.0000**	**28.7852**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Unrefrigerated Warehouse-Rail	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.565681	0.036493	0.190146	0.103622	0.013041	0.005087	0.026037	0.049339	0.002262	0.001910	0.005350	0.000375	0.000655
Other Non-Asphalt Surfaces	0.565681	0.036493	0.190146	0.103622	0.013041	0.005087	0.026037	0.049339	0.002262	0.001910	0.005350	0.000375	0.000655
Unrefrigerated Warehouse-Rail	0.565681	0.036493	0.190146	0.103622	0.013041	0.005087	0.026037	0.049339	0.002262	0.001910	0.005350	0.000375	0.000655

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	44.8080	44.8080	3.9500e-003	8.2000e-004	45.1504
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	44.8080	44.8080	3.9500e-003	8.2000e-004	45.1504
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	300440	44.8080	3.9500e-003	8.2000e-004	45.1504
Total		**44.8080**	**3.9500e-003**	**8.2000e-004**	**45.1504**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	300440	44.8080	3.9500e-003	8.2000e-004	45.1504
Total		**44.8080**	**3.9500e-003**	**8.2000e-004**	**45.1504**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0853	0.0000	2.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.9000e-004	3.9000e-004	0.0000	0.0000	4.1000e-004
Unmitigated	0.0853	0.0000	2.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.9000e-004	3.9000e-004	0.0000	0.0000	4.1000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0176					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0677					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.9000e-004	3.9000e-004	0.0000	0.0000	4.1000e-004
Total	**0.0853**	**0.0000**	**2.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**3.9000e-004**	**3.9000e-004**	**0.0000**	**0.0000**	**4.1000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0176					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0677					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.9000e-004	3.9000e-004	0.0000	0.0000	4.1000e-004
Total	**0.0853**	**0.0000**	**2.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**3.9000e-004**	**3.9000e-004**	**0.0000**	**0.0000**	**4.1000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.5079	0.0438	1.0500e-003	2.9163
Unmitigated	1.5079	0.0438	1.0500e-003	2.9163

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	1.34125 / 0	1.5079	0.0438	1.0500e-003	2.9163
Total		**1.5079**	**0.0438**	**1.0500e-003**	**2.9163**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	1.34125 / 0	1.5079	0.0438	1.0500e-003	2.9163
Total		**1.5079**	**0.0438**	**1.0500e-003**	**2.9163**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.1063	0.0654	0.0000	2.7408
Unmitigated	1.1063	0.0654	0.0000	2.7408

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	5.45	1.1063	0.0654	0.0000	2.7408
Total		**1.1063**	**0.0654**	**0.0000**	**2.7408**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	5.45	1.1063	0.0654	0.0000	2.7408
Total		**1.1063**	**0.0654**	**0.0000**	**2.7408**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

BART Hayward Maintenance Complex Phase 2

Alameda County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-Rail	5.80	1000sqft	0.13	5,800.00	0
Other Asphalt Surfaces	6.00	Acre	5.87	261,360.00	0
Other Non-Asphalt Surfaces	10.00	Acre	10.00	435,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2028
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 intensity based on 5-year average (PG&E 2015)

Land Use - The Phase 2 project site consists of approximately 16 acres of undeveloped land in the northeast quadrant of the HMC property. The northernmost 6 acres of the Phase 2 area would be developed as the site of the Northern Mainline Connector.

Construction Phase - Based on Construction Scenario as described in the Project Description.

Off-road Equipment - Default grading equipment.

Off-road Equipment - Default Grading Equipment.

Off-road Equipment - Default grading equipment

Off-road Equipment - Default paving equipment.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Trips and VMT - Based on Construction Scenario as described in the Project Description.

Grading - Based on Construction Scenario as described in the Project Description.

Vehicle Trips - The proposed project would not generate new vehicle trips.

Energy Use - Based on energy usage provided to LSA.

Construction Off-road Equipment Mitigation - Assuming compliance with BAAQMD Basic Construction Mitigation Measures.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	300.00	165.00
tblConstructionPhase	NumDays	300.00	100.00
tblConstructionPhase	NumDays	300.00	60.00
tblConstructionPhase	NumDays	300.00	60.00
tblConstructionPhase	NumDays	30.00	110.00
tblConstructionPhase	NumDays	30.00	305.00

tblConstructionPhase	NumDays	30.00	20.00
tblConstructionPhase	NumDays	20.00	30.00
tblEnergyUse	LightingElect	2.17	30.00
tblEnergyUse	NT24E	1.38	18.80
tblEnergyUse	NT24NG	0.21	0.00
tblEnergyUse	T24E	0.24	3.00
tblEnergyUse	T24NG	1.18	0.00
tblGrading	AcresOfGrading	412.50	16.00
tblGrading	AcresOfGrading	1,143.75	16.00
tblGrading	AcresOfGrading	75.00	16.00
tblGrading	MaterialImported	0.00	84,700.00
tblGrading	MaterialImported	0.00	5,800.00
tblGrading	MaterialImported	0.00	3,150.00
tblLandUse	LotAcreage	6.00	5.87
tblOffRoadEquipment	HorsePower	402.00	46.00
tblOffRoadEquipment	LoadFactor	0.38	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00

tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblTripsAndVMT	HaulingTripNumber	10,588.00	11,300.00
tblTripsAndVMT	HaulingTripNumber	0.00	160.00
tblTripsAndVMT	HaulingTripNumber	0.00	142.00
tblTripsAndVMT	HaulingTripNumber	0.00	652.00
tblTripsAndVMT	HaulingTripNumber	0.00	360.00
tblTripsAndVMT	HaulingTripNumber	725.00	800.00
tblTripsAndVMT	HaulingTripNumber	394.00	700.00
tblTripsAndVMT	VendorTripNumber	115.00	0.00
tblTripsAndVMT	VendorTripNumber	115.00	0.00
tblTripsAndVMT	VendorTripNumber	115.00	0.00
tblTripsAndVMT	VendorTripNumber	115.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	80.00
tblTripsAndVMT	WorkerTripNumber	20.00	80.00
tblTripsAndVMT	WorkerTripNumber	295.00	80.00
tblTripsAndVMT	WorkerTripNumber	295.00	80.00
tblTripsAndVMT	WorkerTripNumber	15.00	80.00
tblTripsAndVMT	WorkerTripNumber	48.00	80.00
tblTripsAndVMT	WorkerTripNumber	295.00	80.00
tblTripsAndVMT	WorkerTripNumber	295.00	80.00
tblTripsAndVMT	WorkerTripNumber	20.00	80.00
tblVehicleTrips	ST_TR	1.68	0.00

tblVehicleTrips	SU_TR	1.68	0.00
tblVehicleTrips	WD_TR	1.68	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	5.5554	65.2496	47.4826	0.1752	11.7685	2.0359	13.8044	5.6721	1.8741	7.5462	0.0000	17,716.4593	17,716.4593	3.2634	0.0000	17,798.0442
2025	5.0623	58.2847	45.2591	0.1743	60.1719	1.7287	61.9006	17.5530	1.5915	19.1444	0.0000	17,633.2492	17,633.2492	3.2606	0.0000	17,714.7631
2026	8.8377	75.6296	77.2409	0.1962	9.8139	3.0341	12.8479	5.1635	2.8411	8.0046	0.0000	18,887.9424	18,887.9424	4.8847	0.0000	19,010.0597
2027	8.8269	75.6145	77.1497	0.1960	11.1695	3.0338	12.8885	5.4021	2.8409	8.0144	0.0000	18,868.5201	18,868.5201	4.8839	0.0000	18,990.6169
Maximum	**8.8377**	**75.6296**	**77.2409**	**0.1962**	**60.1719**	**3.0341**	**61.9006**	**17.5530**	**2.8411**	**19.1444**	**0.0000**	**18,887.9424**	**18,887.9424**	**4.8847**	**0.0000**	**19,010.0597**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	5.5554	65.2496	47.4826	0.1752	6.6676	2.0359	8.7035	2.9248	1.8741	4.7989	0.0000	17,716.4593	17,716.4593	3.2634	0.0000	17,798.0441
2025	5.0623	58.2847	45.2591	0.1743	55.0709	1.7287	56.7997	14.8056	1.5915	16.3971	0.0000	17,633.2492	17,633.2492	3.2606	0.0000	17,714.7631
2026	8.8377	75.6296	77.2409	0.1962	4.8139	3.0341	7.8479	2.4290	2.8411	5.2701	0.0000	18,887.9424	18,887.9424	4.8847	0.0000	19,010.0597
2027	8.8269	75.6145	77.1497	0.1960	5.7248	3.0338	7.8885	2.6193	2.8409	5.2800	0.0000	18,868.5201	18,868.5201	4.8839	0.0000	18,990.6169
Maximum	**8.8377**	**75.6296**	**77.2409**	**0.1962**	**55.0709**	**3.0341**	**56.7997**	**14.8056**	**2.8411**	**16.3971**	**0.0000**	**18,887.9424**	**18,887.9424**	**4.8847**	**0.0000**	**19,010.0597**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**22.22**	**0.00**	**19.91**	**32.59**	**0.00**	**25.67**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.4674	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.4674**	**2.0000e-005**	**2.2200e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**4.7700e-003**	**4.7700e-003**	**1.0000e-005**	**0.0000**	**5.0800e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.4674	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.4674**	**2.0000e-005**	**2.2200e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**4.7700e-003**	**4.7700e-003**	**1.0000e-005**	**0.0000**	**5.0800e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Clearing, Grubbing, and Site Grading	Grading	8/5/2024	1/3/2025	5	110	
2	Installation of Underground Stormwater Storage	Trenching	1/6/2025	2/14/2025	5	30	
3	Installation of Industrial Parkway Structure	Building Construction	2/17/2025	10/3/2025	5	165	
4	Installation of Retaining Walls	Building Construction	10/6/2025	2/20/2026	5	100	
5	Installation of Access Roadway and Cart Paths	Paving	2/23/2026	4/3/2026	5	30	
6	Installation of Trackwork	Grading	4/6/2026	6/4/2027	5	305	
7	Installation of Gap Breaker Stations	Building Construction	6/7/2027	8/27/2027	5	60	
8	Installation of Train Control House	Building Construction	8/30/2027	11/19/2027	5	60	
9	Bio Retention Basin	Grading	11/22/2027	12/17/2027	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 15.87

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

BART Hayward Maintenance Complex Phase 2 - Alameda County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Clearing, Grubbing, and Site Grading	Excavators	2	12.00	158	0.38
Clearing, Grubbing, and Site Grading	Graders	1	12.00	187	0.41
Clearing, Grubbing, and Site Grading	Rubber Tired Dozers	1	12.00	247	0.40
Clearing, Grubbing, and Site Grading	Scrapers	2	12.00	367	0.48
Clearing, Grubbing, and Site Grading	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Underground Stormwater Storage	Cranes	2	12.00	231	0.29
Installation of Underground Stormwater Storage	Excavators	2	12.00	158	0.38
Installation of Underground Stormwater Storage	Off-Highway Trucks	2	12.00	402	0.38
Installation of Underground Stormwater Storage	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Industrial Parkway Structure	Air Compressors	1	12.00	78	0.48
Installation of Industrial Parkway Structure	Cement and Mortar Mixers	1	12.00	9	0.56
Installation of Industrial Parkway Structure	Cranes	2	12.00	231	0.29
Installation of Industrial Parkway Structure	Forklifts	0	8.00	89	0.20
Installation of Industrial Parkway Structure	Generator Sets	1	12.00	84	0.74
Installation of Industrial Parkway Structure	Off-Highway Trucks	2	12.00	46	0.45
Installation of Industrial Parkway Structure	Pumps	1	12.00	84	0.74
Installation of Industrial Parkway Structure	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Industrial Parkway Structure	Welders	0	8.00	46	0.45
Installation of Retaining Walls	Bore/Drill Rigs	2	12.00	221	0.50
Installation of Retaining Walls	Cranes	2	12.00	231	0.29
Installation of Retaining Walls	Forklifts	0	8.00	89	0.20
Installation of Retaining Walls	Generator Sets	0	8.00	84	0.74
Installation of Retaining Walls	Tractors/Loaders/Backhoes	0	7.00	97	0.37

Installation of Retaining Walls	Welders	0	8.00	46	0.45
Installation of Access Roadway and Cart Paths	Pavers	2	12.00	130	0.42
Installation of Access Roadway and Cart Paths	Paving Equipment	2	12.00	132	0.36
Installation of Access Roadway and Cart Paths	Rollers	2	12.00	80	0.38
Installation of Trackwork	Air Compressors	1	12.00	78	0.48
Installation of Trackwork	Cement and Mortar Mixers	1	12.00	9	0.56
Installation of Trackwork	Cranes	2	12.00	231	0.29
Installation of Trackwork	Dumpers/Tenders	2	12.00	16	0.38
Installation of Trackwork	Excavators	2	12.00	158	0.38
Installation of Trackwork	Generator Sets	1	12.00	84	0.74
Installation of Trackwork	Graders	1	12.00	187	0.41
Installation of Trackwork	Off-Highway Trucks	2	12.00	402	0.38
Installation of Trackwork	Pumps	2	12.00	84	0.74
Installation of Trackwork	Rubber Tired Dozers	1	12.00	247	0.40
Installation of Trackwork	Scrapers	2	12.00	367	0.48
Installation of Trackwork	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Gap Breaker Stations	Cranes	2	12.00	231	0.29
Installation of Gap Breaker Stations	Forklifts	0	8.00	89	0.20
Installation of Gap Breaker Stations	Generator Sets	0	8.00	84	0.74
Installation of Gap Breaker Stations	Off-Highway Trucks	4	12.00	402	0.38
Installation of Gap Breaker Stations	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Installation of Gap Breaker Stations	Welders	0	8.00	46	0.45
Installation of Train Control House	Cement and Mortar Mixers	1	12.00	9	0.56
Installation of Train Control House	Cranes	1	12.00	231	0.29
Installation of Train Control House	Dumpers/Tenders	1	12.00	16	0.38
Installation of Train Control House	Forklifts	0	8.00	89	0.20

Installation of Train Control House	Generator Sets	1	12.00	84	0.74
Installation of Train Control House	Graders	1	12.00	187	0.41
Installation of Train Control House	Off-Highway Trucks	2	12.00	402	0.38
Installation of Train Control House	Pumps	1	12.00	84	0.74
Installation of Train Control House	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Train Control House	Welders	0	8.00	46	0.45
Bio Retention Basin	Excavators	2	12.00	158	0.38
Bio Retention Basin	Graders	1	12.00	187	0.41
Bio Retention Basin	Rubber Tired Dozers	1	12.00	247	0.40
Bio Retention Basin	Scrapers	2	12.00	367	0.48
Bio Retention Basin	Tractors/Loaders/Backhoes	2	12.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Clearing, Grubbing, and Site Grading	8	80.00	0.00	11,300.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Underground Stormwa	8	80.00	0.00	160.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Industrial Parkway Str	10	80.00	0.00	142.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Retaining Walls	4	80.00	0.00	652.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Access Roadway and Cart Pat	6	80.00	0.00	360.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Trackwork	19	80.00	0.00	800.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Gap Breaker Stations	6	80.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Train Control House	10	80.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bio Retention Basin	8	80.00	0.00	700.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Clearing, Grubbing, and Site Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2745	0.0000	9.2745	4.9952	0.0000	4.9952			0.0000			0.0000
Off-Road	4.8272	48.5654	41.5842	0.0931		2.0031	2.0031		1.8429	1.8429		9,014.6230	9,014.6230	2.9155		9,087.5108
Total	**4.8272**	**48.5654**	**41.5842**	**0.0931**	**9.2745**	**2.0031**	**11.2776**	**4.9952**	**1.8429**	**6.8380**		**9,014.6230**	**9,014.6230**	**2.9155**		**9,087.5108**

3.2 Clearing, Grubbing, and Site Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5102	16.5678	4.2734	0.0763	1.8369	0.0289	1.8657	0.5026	0.0276	0.5302		8,127.7611	8,127.7611	0.3368		8,136.1811
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2180	0.1164	1.6250	5.7600e-003	0.6572	3.9600e-003	0.6611	0.1743	3.6500e-003	0.1780		574.0751	574.0751	0.0111		574.3522
Total	**0.7282**	**16.6842**	**5.8983**	**0.0820**	**2.4941**	**0.0328**	**2.5269**	**0.6769**	**0.0313**	**0.7082**		**8,701.8363**	**8,701.8363**	**0.3479**		**8,710.5333**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.1735	0.0000	4.1735	2.2478	0.0000	2.2478			0.0000			0.0000
Off-Road	4.8272	48.5654	41.5842	0.0931		2.0031	2.0031		1.8429	1.8429	0.0000	9,014.6230	9,014.6230	2.9155		9,087.5108
Total	**4.8272**	**48.5654**	**41.5842**	**0.0931**	**4.1735**	**2.0031**	**6.1766**	**2.2478**	**1.8429**	**4.0907**	**0.0000**	**9,014.6230**	**9,014.6230**	**2.9155**		**9,087.5108**

3.2 Clearing, Grubbing, and Site Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5102	16.5678	4.2734	0.0763	1.8369	0.0289	1.8657	0.5026	0.0276	0.5302		8,127.7611	8,127.7611	0.3368		8,136.1811
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2180	0.1164	1.6250	5.7600e-003	0.6572	3.9600e-003	0.6611	0.1743	3.6500e-003	0.1780		574.0751	574.0751	0.0111		574.3522
Total	**0.7282**	**16.6842**	**5.8983**	**0.0820**	**2.4941**	**0.0328**	**2.5269**	**0.6769**	**0.0313**	**0.7082**		**8,701.8363**	**8,701.8363**	**0.3479**		**8,710.5333**

3.2 Clearing, Grubbing, and Site Grading - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2745	0.0000	9.2745	4.9952	0.0000	4.9952			0.0000			0.0000
Off-Road	4.3519	41.9143	39.4966	0.0931		1.6963	1.6963		1.5606	1.5606		9,012.4222	9,012.4222	2.9148		9,085.2922
Total	**4.3519**	**41.9143**	**39.4966**	**0.0931**	**9.2745**	**1.6963**	**10.9708**	**4.9952**	**1.5606**	**6.5558**		**9,012.4222**	**9,012.4222**	**2.9148**		**9,085.2922**

3.2 Clearing, Grubbing, and Site Grading - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5055	16.2648	4.2585	0.0757	50.2403	0.0285	50.2687	12.3835	0.0272	12.4107		8,070.2095	8,070.2095	0.3357		8,078.6024
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2049	0.1056	1.5039	5.5200e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		550.6175	550.6175	0.0100		550.8686
Total	**0.7104**	**16.3704**	**5.7625**	**0.0812**	**50.8974**	**0.0324**	**50.9298**	**12.5578**	**0.0308**	**12.5886**		**8,620.8270**	**8,620.8270**	**0.3458**		**8,629.4710**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.1735	0.0000	4.1735	2.2478	0.0000	2.2478			0.0000			0.0000
Off-Road	4.3519	41.9143	39.4966	0.0931		1.6963	1.6963		1.5606	1.5606	0.0000	9,012.4222	9,012.4222	2.9148		9,085.2922
Total	**4.3519**	**41.9143**	**39.4966**	**0.0931**	**4.1735**	**1.6963**	**5.8699**	**2.2478**	**1.5606**	**3.8085**	**0.0000**	**9,012.4222**	**9,012.4222**	**2.9148**		**9,085.2922**

3.2 Clearing, Grubbing, and Site Grading - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5055	16.2648	4.2585	0.0757	50.2403	0.0285	50.2687	12.3835	0.0272	12.4107		8,070.2095	8,070.2095	0.3357		8,078.6024
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2049	0.1056	1.5039	5.5200e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		550.6175	550.6175	0.0100		550.8686
Total	**0.7104**	**16.3704**	**5.7625**	**0.0812**	**50.8974**	**0.0324**	**50.9298**	**12.5578**	**0.0308**	**12.5886**		**8,620.8270**	**8,620.8270**	**0.3458**		**8,629.4710**

3.3 Installation of Underground Stormwater Storage - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.2689	25.7723	31.2329	0.0819		1.0533	1.0533		0.9690	0.9690		7,922.6862	7,922.6862	2.5624		7,986.7451
Total	**3.2689**	**25.7723**	**31.2329**	**0.0819**		**1.0533**	**1.0533**		**0.9690**	**0.9690**		**7,922.6862**	**7,922.6862**	**2.5624**		**7,986.7451**

3.3 Installation of Underground Stormwater Storage - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0263	0.8444	0.2211	3.9300e-003	0.0934	1.4800e-003	0.0949	0.0256	1.4100e-003	0.0270		418.9843	418.9843	0.0174		419.4201
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2049	0.1056	1.5039	5.5200e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		550.6175	550.6175	0.0100		550.8686
Total	**0.2312**	**0.9501**	**1.7250**	**9.4500e-003**	**0.7506**	**5.3800e-003**	**0.7560**	**0.1999**	**5.0000e-003**	**0.2049**		**969.6019**	**969.6019**	**0.0275**		**970.2887**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.2689	25.7723	31.2329	0.0819		1.0533	1.0533		0.9690	0.9690	0.0000	7,922.6862	7,922.6862	2.5624		7,986.7451
Total	**3.2689**	**25.7723**	**31.2329**	**0.0819**		**1.0533**	**1.0533**		**0.9690**	**0.9690**	**0.0000**	**7,922.6862**	**7,922.6862**	**2.5624**		**7,986.7451**

3.3 Installation of Underground Stormwater Storage - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0263	0.8444	0.2211	3.9300e-003	0.0934	1.4800e-003	0.0949	0.0256	1.4100e-003	0.0270		418.9843	418.9843	0.0174		419.4201
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2049	0.1056	1.5039	5.5200e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		550.6175	550.6175	0.0100		550.8686
Total	**0.2312**	**0.9501**	**1.7250**	**9.4500e-003**	**0.7506**	**5.3800e-003**	**0.7560**	**0.1999**	**5.0000e-003**	**0.2049**		**969.6019**	**969.6019**	**0.0275**		**970.2887**

3.4 Installation of Industrial Parkway Structure - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5935	23.5848	27.0415	0.0534		0.9851	0.9851		0.9398	0.9398		5,090.4206	5,090.4206	0.9462		5,114.0758
Total	**2.5935**	**23.5848**	**27.0415**	**0.0534**		**0.9851**	**0.9851**		**0.9398**	**0.9398**		**5,090.4206**	**5,090.4206**	**0.9462**		**5,114.0758**

3.4 Installation of Industrial Parkway Structure - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.2400e-003	0.1363	0.0357	6.3000e-004	0.0151	2.4000e-004	0.0153	4.1300e-003	2.3000e-004	4.3600e-003		67.6088	67.6088	2.8100e-003		67.6792
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2049	0.1056	1.5039	5.5200e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		550.6175	550.6175	0.0100		550.8686
Total	**0.2092**	**0.2419**	**1.5396**	**6.1500e-003**	**0.6723**	**4.1400e-003**	**0.6764**	**0.1785**	**3.8200e-003**	**0.1823**		**618.2264**	**618.2264**	**0.0129**		**618.5477**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5935	23.5848	27.0415	0.0534		0.9851	0.9851		0.9398	0.9398	0.0000	5,090.4205	5,090.4205	0.9462		5,114.0758
Total	**2.5935**	**23.5848**	**27.0415**	**0.0534**		**0.9851**	**0.9851**		**0.9398**	**0.9398**	**0.0000**	**5,090.4205**	**5,090.4205**	**0.9462**		**5,114.0758**

3.4 Installation of Industrial Parkway Structure - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.2400e-003	0.1363	0.0357	6.3000e-004	0.0151	2.4000e-004	0.0153	4.1300e-003	2.3000e-004	4.3600e-003		67.6088	67.6088	2.8100e-003		67.6792
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2049	0.1056	1.5039	5.5200e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		550.6175	550.6175	0.0100		550.8686
Total	**0.2092**	**0.2419**	**1.5396**	**6.1500e-003**	**0.6723**	**4.1400e-003**	**0.6764**	**0.1785**	**3.8200e-003**	**0.1823**		**618.2264**	**618.2264**	**0.0129**		**618.5477**

3.5 Installation of Retaining Walls - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5664	15.1001	11.3182	0.0458		0.5877	0.5877		0.5407	0.5407		4,428.2292	4,428.2292	1.4322		4,464.0337
Total	**1.5664**	**15.1001**	**11.3182**	**0.0458**		**0.5877**	**0.5877**		**0.5407**	**0.5407**		**4,428.2292**	**4,428.2292**	**1.4322**		**4,464.0337**

3.5 Installation of Retaining Walls - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0321	1.0323	0.2703	4.8000e-003	0.1648	1.8100e-003	0.1666	0.0437	1.7300e-003	0.0455		512.2083	512.2083	0.0213		512.7410
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2049	0.1056	1.5039	5.5200e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		550.6175	550.6175	0.0100		550.8686
Total	**0.2370**	**1.1379**	**1.7742**	**0.0103**	**0.8220**	**5.7100e-003**	**0.8277**	**0.2181**	**5.3200e-003**	**0.2234**		**1,062.8259**	**1,062.8259**	**0.0314**		**1,063.6096**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5664	15.1001	11.3182	0.0458		0.5877	0.5877		0.5407	0.5407	0.0000	4,428.2292	4,428.2292	1.4322		4,464.0337
Total	**1.5664**	**15.1001**	**11.3182**	**0.0458**		**0.5877**	**0.5877**		**0.5407**	**0.5407**	**0.0000**	**4,428.2292**	**4,428.2292**	**1.4322**		**4,464.0337**

3.5 Installation of Retaining Walls - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0321	1.0323	0.2703	4.8000e-003	0.1648	1.8100e-003	0.1666	0.0437	1.7300e-003	0.0455		512.2083	512.2083	0.0213		512.7410
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2049	0.1056	1.5039	5.5200e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		550.6175	550.6175	0.0100		550.8686
Total	**0.2370**	**1.1379**	**1.7742**	**0.0103**	**0.8220**	**5.7100e-003**	**0.8277**	**0.2181**	**5.3200e-003**	**0.2234**		**1,062.8259**	**1,062.8259**	**0.0314**		**1,063.6096**

3.5 Installation of Retaining Walls - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5664	15.1001	11.3182	0.0458		0.5877	0.5877		0.5407	0.5407		4,428.2292	4,428.2292	1.4322		4,464.0337
Total	**1.5664**	**15.1001**	**11.3182**	**0.0458**		**0.5877**	**0.5877**		**0.5407**	**0.5407**		**4,428.2292**	**4,428.2292**	**1.4322**		**4,464.0337**

3.5 Installation of Retaining Walls - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0318	1.0147	0.2694	4.7700e-003	0.2610	1.7800e-003	0.2627	0.0673	1.7100e-003	0.0690		508.9425	508.9425	0.0212		509.4733
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1937	0.0965	1.4014	5.3100e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		530.1241	530.1241	9.1500e-003		530.3529
Total	**0.2255**	**1.1112**	**1.6708**	**0.0101**	**0.9181**	**5.5700e-003**	**0.9237**	**0.2417**	**5.1900e-003**	**0.2468**		**1,039.0667**	**1,039.0667**	**0.0304**		**1,039.8262**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5664	15.1001	11.3182	0.0458		0.5877	0.5877		0.5407	0.5407	0.0000	4,428.2292	4,428.2292	1.4322		4,464.0337
Total	**1.5664**	**15.1001**	**11.3182**	**0.0458**		**0.5877**	**0.5877**		**0.5407**	**0.5407**	**0.0000**	**4,428.2292**	**4,428.2292**	**1.4322**		**4,464.0337**

3.5 Installation of Retaining Walls - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0318	1.0147	0.2694	4.7700e-003	0.2610	1.7800e-003	0.2627	0.0673	1.7100e-003	0.0690		508.9425	508.9425	0.0212		509.4733
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1937	0.0965	1.4014	5.3100e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		530.1241	530.1241	9.1500e-003		530.3529
Total	**0.2255**	**1.1112**	**1.6708**	**0.0101**	**0.9181**	**5.5700e-003**	**0.9237**	**0.2417**	**5.1900e-003**	**0.2468**		**1,039.0667**	**1,039.0667**	**0.0304**		**1,039.8262**

3.6 Installation of Access Roadway and Cart Paths - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3727	12.8725	21.8670	0.0342		0.6278	0.6278		0.5776	0.5776		3,310.1177	3,310.1177	1.0706		3,336.8817
Paving	0.5127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8854**	**12.8725**	**21.8670**	**0.0342**		**0.6278**	**0.6278**		**0.5776**	**0.5776**		**3,310.1177**	**3,310.1177**	**1.0706**		**3,336.8817**

3.6 Installation of Access Roadway and Cart Paths - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0585	1.8676	0.4958	8.7800e-003	0.2101	3.2800e-003	0.2134	0.0576	3.1400e-003	0.0608		936.7041	936.7041	0.0391		937.6810
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1937	0.0965	1.4014	5.3100e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		530.1241	530.1241	9.1500e-003		530.3529
Total	**0.2522**	**1.9641**	**1.8972**	**0.0141**	**0.8673**	**7.0700e-003**	**0.8744**	**0.2320**	**6.6200e-003**	**0.2386**		**1,466.8282**	**1,466.8282**	**0.0482**		**1,468.0339**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3727	12.8725	21.8670	0.0342		0.6278	0.6278		0.5776	0.5776	0.0000	3,310.1177	3,310.1177	1.0706		3,336.8817
Paving	0.5127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8854**	**12.8725**	**21.8670**	**0.0342**		**0.6278**	**0.6278**		**0.5776**	**0.5776**	**0.0000**	**3,310.1177**	**3,310.1177**	**1.0706**		**3,336.8817**

3.6 Installation of Access Roadway and Cart Paths - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0585	1.8676	0.4958	8.7800e-003	0.2101	3.2800e-003	0.2134	0.0576	3.1400e-003	0.0608		936.7041	936.7041	0.0391		937.6810
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1937	0.0965	1.4014	5.3100e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		530.1241	530.1241	9.1500e-003		530.3529
Total	**0.2522**	**1.9641**	**1.8972**	**0.0141**	**0.8673**	**7.0700e-003**	**0.8744**	**0.2320**	**6.6200e-003**	**0.2386**		**1,466.8282**	**1,466.8282**	**0.0482**		**1,468.0339**

3.7 Installation of Trackwork - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0909	0.0000	9.0909	4.9717	0.0000	4.9717			0.0000			0.0000
Off-Road	8.6313	75.1249	75.7312	0.1889		3.0295	3.0295		2.8369	2.8369		18,153.0742	18,153.0742	4.8670		18,274.7493
Total	**8.6313**	**75.1249**	**75.7312**	**0.1889**	**9.0909**	**3.0295**	**12.1205**	**4.9717**	**2.8369**	**7.8086**		**18,153.0742**	**18,153.0742**	**4.8670**		**18,274.7493**

3.7 Installation of Trackwork - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0128	0.4082	0.1084	1.9200e-003	0.0658	7.2000e-004	0.0665	0.0175	6.9000e-004	0.0182		204.7441	204.7441	8.5400e-003		204.9576
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1937	0.0965	1.4014	5.3100e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		530.1241	530.1241	9.1500e-003		530.3529
Total	**0.2065**	**0.5047**	**1.5097**	**7.2300e-003**	**0.7230**	**4.5100e-003**	**0.7275**	**0.1918**	**4.1700e-003**	**0.1960**		**734.8682**	**734.8682**	**0.0177**		**735.3105**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0909	0.0000	4.0909	2.2373	0.0000	2.2373			0.0000			0.0000
Off-Road	8.6313	75.1249	75.7312	0.1889		3.0295	3.0295		2.8369	2.8369	0.0000	18,153.0742	18,153.0742	4.8670		18,274.7493
Total	**8.6313**	**75.1249**	**75.7312**	**0.1889**	**4.0909**	**3.0295**	**7.1205**	**2.2373**	**2.8369**	**5.0742**	**0.0000**	**18,153.0742**	**18,153.0742**	**4.8670**		**18,274.7493**

3.7 Installation of Trackwork - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0128	0.4082	0.1084	1.9200e-003	0.0658	7.2000e-004	0.0665	0.0175	6.9000e-004	0.0182		204.7441	204.7441	8.5400e-003		204.9576
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1937	0.0965	1.4014	5.3100e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		530.1241	530.1241	9.1500e-003		530.3529
Total	**0.2065**	**0.5047**	**1.5097**	**7.2300e-003**	**0.7230**	**4.5100e-003**	**0.7275**	**0.1918**	**4.1700e-003**	**0.1960**		**734.8682**	**734.8682**	**0.0177**		**735.3105**

3.7 Installation of Trackwork - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0909	0.0000	9.0909	4.9717	0.0000	4.9717			0.0000			0.0000
Off-Road	8.6313	75.1249	75.7312	0.1889		3.0295	3.0295		2.8369	2.8369		18,153.0742	18,153.0742	4.8670		18,274.7493
Total	**8.6313**	**75.1249**	**75.7312**	**0.1889**	**9.0909**	**3.0295**	**12.1205**	**4.9717**	**2.8369**	**7.8086**		**18,153.0742**	**18,153.0742**	**4.8670**		**18,274.7493**

3.7 Installation of Trackwork - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0127	0.4012	0.1081	1.9100e-003	0.1065	7.1000e-004	0.1073	0.0275	6.8000e-004	0.0282		203.5245	203.5245	8.5200e-003		203.7374
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1829	0.0884	1.3105	5.1300e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		511.9214	511.9214	8.3500e-003		512.1302
Total	**0.1956**	**0.4896**	**1.4186**	**7.0400e-003**	**0.7637**	**4.3000e-003**	**0.7680**	**0.2018**	**3.9800e-003**	**0.2058**		**715.4459**	**715.4459**	**0.0169**		**715.8676**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0909	0.0000	4.0909	2.2373	0.0000	2.2373			0.0000			0.0000
Off-Road	8.6313	75.1249	75.7312	0.1889		3.0295	3.0295		2.8369	2.8369	0.0000	18,153.0742	18,153.0742	4.8670		18,274.7493
Total	**8.6313**	**75.1249**	**75.7312**	**0.1889**	**4.0909**	**3.0295**	**7.1205**	**2.2373**	**2.8369**	**5.0742**	**0.0000**	**18,153.0742**	**18,153.0742**	**4.8670**		**18,274.7493**

3.7 Installation of Trackwork - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0127	0.4012	0.1081	1.9100e-003	0.1065	7.1000e-004	0.1073	0.0275	6.8000e-004	0.0282		203.5245	203.5245	8.5200e-003		203.7374
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1829	0.0884	1.3105	5.1300e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		511.9214	511.9214	8.3500e-003		512.1302
Total	**0.1956**	**0.4896**	**1.4186**	**7.0400e-003**	**0.7637**	**4.3000e-003**	**0.7680**	**0.2018**	**3.9800e-003**	**0.2058**		**715.4459**	**715.4459**	**0.0169**		**715.8676**

3.8 Installation of Gap Breaker Stations - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.8039	26.7003	24.3222	0.0967		1.0186	1.0186		0.9371	0.9371		9,354.5313	9,354.5313	3.0254		9,430.1674
Total	**3.8039**	**26.7003**	**24.3222**	**0.0967**		**1.0186**	**1.0186**		**0.9371**	**0.9371**		**9,354.5313**	**9,354.5313**	**3.0254**		**9,430.1674**

3.8 Installation of Gap Breaker Stations - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1829	0.0884	1.3105	5.1300e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		511.9214	511.9214	8.3500e-003		512.1302
Total	**0.1829**	**0.0884**	**1.3105**	**5.1300e-003**	**0.6572**	**3.5900e-003**	**0.6608**	**0.1743**	**3.3000e-003**	**0.1776**		**511.9214**	**511.9214**	**8.3500e-003**		**512.1302**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.8039	26.7003	24.3222	0.0967		1.0186	1.0186		0.9371	0.9371	0.0000	9,354.5313	9,354.5313	3.0254		9,430.1674
Total	**3.8039**	**26.7003**	**24.3222**	**0.0967**		**1.0186**	**1.0186**		**0.9371**	**0.9371**	**0.0000**	**9,354.5313**	**9,354.5313**	**3.0254**		**9,430.1674**

3.8 Installation of Gap Breaker Stations - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1829	0.0884	1.3105	5.1300e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		511.9214	511.9214	8.3500e-003		512.1302
Total	**0.1829**	**0.0884**	**1.3105**	**5.1300e-003**	**0.6572**	**3.5900e-003**	**0.6608**	**0.1743**	**3.3000e-003**	**0.1776**		**511.9214**	**511.9214**	**8.3500e-003**		**512.1302**

3.9 Installation of Train Control House - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7921	31.0219	33.1424	0.0895		1.1802	1.1802		1.1131	1.1131		8,580.0813	8,580.0813	2.2064		8,635.2420
Total	**3.7921**	**31.0219**	**33.1424**	**0.0895**		**1.1802**	**1.1802**		**1.1131**	**1.1131**		**8,580.0813**	**8,580.0813**	**2.2064**		**8,635.2420**

3.9 Installation of Train Control House - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1829	0.0884	1.3105	5.1300e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		511.9214	511.9214	8.3500e-003		512.1302
Total	**0.1829**	**0.0884**	**1.3105**	**5.1300e-003**	**0.6572**	**3.5900e-003**	**0.6608**	**0.1743**	**3.3000e-003**	**0.1776**		**511.9214**	**511.9214**	**8.3500e-003**		**512.1302**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7921	31.0219	33.1424	0.0895		1.1802	1.1802		1.1131	1.1131	0.0000	8,580.0813	8,580.0813	2.2064		8,635.2420
Total	**3.7921**	**31.0219**	**33.1424**	**0.0895**		**1.1802**	**1.1802**		**1.1131**	**1.1131**	**0.0000**	**8,580.0813**	**8,580.0813**	**2.2064**		**8,635.2420**

3.9 Installation of Train Control House - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1829	0.0884	1.3105	5.1300e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		511.9214	511.9214	8.3500e-003		512.1302
Total	**0.1829**	**0.0884**	**1.3105**	**5.1300e-003**	**0.6572**	**3.5900e-003**	**0.6608**	**0.1743**	**3.3000e-003**	**0.1776**		**511.9214**	**511.9214**	**8.3500e-003**		**512.1302**

3.10 Bio Retention Basin - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.8993	0.0000	9.8993	5.0597	0.0000	5.0597			0.0000			0.0000
Off-Road	4.3519	41.9143	39.4966	0.0931		1.6963	1.6963		1.5606	1.5606		9,012.4222	9,012.4222	2.9148		9,085.2922
Total	**4.3519**	**41.9143**	**39.4966**	**0.0931**	**9.8993**	**1.6963**	**11.5957**	**5.0597**	**1.5606**	**6.6203**		**9,012.4222**	**9,012.4222**	**2.9148**		**9,085.2922**

3.10 Bio Retention Basin - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1692	5.3536	1.4423	0.0255	0.6130	9.4400e-003	0.6224	0.1681	9.0300e-003	0.1771		2,715.7803	2,715.7803	0.1136		2,718.6209
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1829	0.0884	1.3105	5.1300e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		511.9214	511.9214	8.3500e-003		512.1302
Total	**0.3522**	**5.4420**	**2.7528**	**0.0306**	**1.2701**	**0.0130**	**1.2832**	**0.3424**	**0.0123**	**0.3547**		**3,227.7017**	**3,227.7017**	**0.1220**		**3,230.7512**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.4547	0.0000	4.4547	2.2768	0.0000	2.2768			0.0000			0.0000
Off-Road	4.3519	41.9143	39.4966	0.0931		1.6963	1.6963		1.5606	1.5606	0.0000	9,012.4222	9,012.4222	2.9148		9,085.2922
Total	**4.3519**	**41.9143**	**39.4966**	**0.0931**	**4.4547**	**1.6963**	**6.1510**	**2.2768**	**1.5606**	**3.8375**	**0.0000**	**9,012.4222**	**9,012.4222**	**2.9148**		**9,085.2922**

3.10 Bio Retention Basin - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1692	5.3536	1.4423	0.0255	0.6130	9.4400e-003	0.6224	0.1681	9.0300e-003	0.1771		2,715.7803	2,715.7803	0.1136		2,718.6209
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1829	0.0884	1.3105	5.1300e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		511.9214	511.9214	8.3500e-003		512.1302
Total	**0.3522**	**5.4420**	**2.7528**	**0.0306**	**1.2701**	**0.0130**	**1.2832**	**0.3424**	**0.0123**	**0.3547**		**3,227.7017**	**3,227.7017**	**0.1220**		**3,230.7512**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Unrefrigerated Warehouse-Rail	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.565681	0.036493	0.190146	0.103622	0.013041	0.005087	0.026037	0.049339	0.002262	0.001910	0.005350	0.000375	0.000655
Other Non-Asphalt Surfaces	0.565681	0.036493	0.190146	0.103622	0.013041	0.005087	0.026037	0.049339	0.002262	0.001910	0.005350	0.000375	0.000655
Unrefrigerated Warehouse-Rail	0.565681	0.036493	0.190146	0.103622	0.013041	0.005087	0.026037	0.049339	0.002262	0.001910	0.005350	0.000375	0.000655

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4674	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Unmitigated	0.4674	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0962					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3710					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-004	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Total	**0.4674**	**2.0000e-005**	**2.2200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**4.7700e-003**	**4.7700e-003**	**1.0000e-005**		**5.0800e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0962					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3710					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-004	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Total	**0.4674**	**2.0000e-005**	**2.2200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**4.7700e-003**	**4.7700e-003**	**1.0000e-005**		**5.0800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

BART Hayward Maintenance Complex Phase 2

Alameda County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-Rail	5.80	1000sqft	0.13	5,800.00	0
Other Asphalt Surfaces	6.00	Acre	5.87	261,360.00	0
Other Non-Asphalt Surfaces	10.00	Acre	10.00	435,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2028
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 intensity based on 5-year average (PG&E 2015)

Land Use - The Phase 2 project site consists of approximately 16 acres of undeveloped land in the northeast quadrant of the HMC property. The northernmost 6 acres of the Phase 2 area would be developed as the site of the Northern Mainline Connector.

Construction Phase - Based on Construction Scenario as described in the Project Description.

Off-road Equipment - Default grading equipment.

Off-road Equipment - Default Grading Equipment.

Off-road Equipment - Default grading equipment

Off-road Equipment - Default paving equipment.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Off-road Equipment - Based on Construction Equipment identified in the Project Description.

Trips and VMT - Based on Construction Scenario as described in the Project Description.

Grading - Based on Construction Scenario as described in the Project Description.

Vehicle Trips - The proposed project would not generate new vehicle trips.

Energy Use - Based on energy usage provided to LSA.

Construction Off-road Equipment Mitigation - Assuming compliance with BAAQMD Basic Construction Mitigation Measures.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	300.00	165.00
tblConstructionPhase	NumDays	300.00	100.00
tblConstructionPhase	NumDays	300.00	60.00
tblConstructionPhase	NumDays	300.00	60.00
tblConstructionPhase	NumDays	30.00	110.00
tblConstructionPhase	NumDays	30.00	305.00

tblConstructionPhase	NumDays	30.00	20.00
tblConstructionPhase	NumDays	20.00	30.00
tblEnergyUse	LightingElect	2.17	30.00
tblEnergyUse	NT24E	1.38	18.80
tblEnergyUse	NT24NG	0.21	0.00
tblEnergyUse	T24E	0.24	3.00
tblEnergyUse	T24NG	1.18	0.00
tblGrading	AcresOfGrading	412.50	16.00
tblGrading	AcresOfGrading	1,143.75	16.00
tblGrading	AcresOfGrading	75.00	16.00
tblGrading	MaterialImported	0.00	84,700.00
tblGrading	MaterialImported	0.00	5,800.00
tblGrading	MaterialImported	0.00	3,150.00
tblLandUse	LotAcreage	6.00	5.87
tblOffRoadEquipment	HorsePower	402.00	46.00
tblOffRoadEquipment	LoadFactor	0.38	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00

tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblOffRoadEquipment	UsageHours	8.00	12.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblTripsAndVMT	HaulingTripNumber	10,588.00	11,300.00
tblTripsAndVMT	HaulingTripNumber	0.00	160.00
tblTripsAndVMT	HaulingTripNumber	0.00	142.00
tblTripsAndVMT	HaulingTripNumber	0.00	652.00
tblTripsAndVMT	HaulingTripNumber	0.00	360.00
tblTripsAndVMT	HaulingTripNumber	725.00	800.00
tblTripsAndVMT	HaulingTripNumber	394.00	700.00
tblTripsAndVMT	VendorTripNumber	115.00	0.00
tblTripsAndVMT	VendorTripNumber	115.00	0.00
tblTripsAndVMT	VendorTripNumber	115.00	0.00
tblTripsAndVMT	VendorTripNumber	115.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	80.00
tblTripsAndVMT	WorkerTripNumber	20.00	80.00
tblTripsAndVMT	WorkerTripNumber	295.00	80.00
tblTripsAndVMT	WorkerTripNumber	295.00	80.00
tblTripsAndVMT	WorkerTripNumber	15.00	80.00
tblTripsAndVMT	WorkerTripNumber	48.00	80.00
tblTripsAndVMT	WorkerTripNumber	295.00	80.00
tblTripsAndVMT	WorkerTripNumber	295.00	80.00
tblTripsAndVMT	WorkerTripNumber	20.00	80.00
tblVehicleTrips	ST_TR	1.68	0.00

tblVehicleTrips	SU_TR	1.68	0.00
tblVehicleTrips	WD_TR	1.68	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	5.5805	65.5360	47.6402	0.1733	11.7685	2.0364	13.8049	5.6721	1.8746	7.5467	0.0000	17,520.5557	17,520.5557	3.2834	0.0000	17,602.6417
2025	5.0871	58.5601	45.4170	0.1725	60.1719	1.7292	61.9011	17.5530	1.5919	19.1448	0.0000	17,441.4333	17,441.4333	3.2803	0.0000	17,523.4402
2026	8.8491	75.6591	77.1432	0.1957	9.8139	3.0341	12.8479	5.1635	2.8411	8.0046	0.0000	18,841.9860	18,841.9860	4.8845	0.0000	18,964.0983
2027	8.8383	75.6418	77.0557	0.1955	11.1695	3.0339	12.8885	5.4021	2.8409	8.0144	0.0000	18,824.0343	18,824.0343	4.8837	0.0000	18,946.1270
Maximum	**8.8491**	**75.6591**	**77.1432**	**0.1957**	**60.1719**	**3.0341**	**61.9011**	**17.5530**	**2.8411**	**19.1448**	**0.0000**	**18,841.9860**	**18,841.9860**	**4.8845**	**0.0000**	**18,964.0983**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	5.5805	65.5360	47.6402	0.1733	6.6676	2.0364	8.7040	2.9248	1.8746	4.7994	0.0000	17,520.5557	17,520.5557	3.2834	0.0000	17,602.6417
2025	5.0871	58.5601	45.4170	0.1725	55.0709	1.7292	56.8001	14.8056	1.5919	16.3975	0.0000	17,441.4333	17,441.4333	3.2803	0.0000	17,523.4402
2026	8.8491	75.6591	77.1432	0.1957	4.8139	3.0341	7.8479	2.4290	2.8411	5.2701	0.0000	18,841.9860	18,841.9860	4.8845	0.0000	18,964.0983
2027	8.8383	75.6418	77.0557	0.1955	5.7248	3.0339	7.8885	2.6193	2.8409	5.2800	0.0000	18,824.0343	18,824.0343	4.8837	0.0000	18,946.1269
Maximum	**8.8491**	**75.6591**	**77.1432**	**0.1957**	**55.0709**	**3.0341**	**56.8001**	**14.8056**	**2.8411**	**16.3975**	**0.0000**	**18,841.9860**	**18,841.9860**	**4.8845**	**0.0000**	**18,964.0983**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**22.22**	**0.00**	**19.91**	**32.59**	**0.00**	**25.67**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.4674	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.4674**	**2.0000e-005**	**2.2200e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**4.7700e-003**	**4.7700e-003**	**1.0000e-005**	**0.0000**	**5.0800e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.4674	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.4674**	**2.0000e-005**	**2.2200e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**4.7700e-003**	**4.7700e-003**	**1.0000e-005**	**0.0000**	**5.0800e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Clearing, Grubbing, and Site Grading	Grading	8/5/2024	1/3/2025	5	110	
2	Installation of Underground Stormwater Storage	Trenching	1/6/2025	2/14/2025	5	30	
3	Installation of Industrial Parkway Structure	Building Construction	2/17/2025	10/3/2025	5	165	
4	Installation of Retaining Walls	Building Construction	10/6/2025	2/20/2026	5	100	
5	Installation of Access Roadway and Cart Paths	Paving	2/23/2026	4/3/2026	5	30	
6	Installation of Trackwork	Grading	4/6/2026	6/4/2027	5	305	
7	Installation of Gap Breaker Stations	Building Construction	6/7/2027	8/27/2027	5	60	
8	Installation of Train Control House	Building Construction	8/30/2027	11/19/2027	5	60	
9	Bio Retention Basin	Grading	11/22/2027	12/17/2027	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 15.87

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

BART Hayward Maintenance Complex Phase 2 - Alameda County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Clearing, Grubbing, and Site Grading	Excavators	2	12.00	158	0.38
Clearing, Grubbing, and Site Grading	Graders	1	12.00	187	0.41
Clearing, Grubbing, and Site Grading	Rubber Tired Dozers	1	12.00	247	0.40
Clearing, Grubbing, and Site Grading	Scrapers	2	12.00	367	0.48
Clearing, Grubbing, and Site Grading	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Underground Stormwater Storage	Cranes	2	12.00	231	0.29
Installation of Underground Stormwater Storage	Excavators	2	12.00	158	0.38
Installation of Underground Stormwater Storage	Off-Highway Trucks	2	12.00	402	0.38
Installation of Underground Stormwater Storage	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Industrial Parkway Structure	Air Compressors	1	12.00	78	0.48
Installation of Industrial Parkway Structure	Cement and Mortar Mixers	1	12.00	9	0.56
Installation of Industrial Parkway Structure	Cranes	2	12.00	231	0.29
Installation of Industrial Parkway Structure	Forklifts	0	8.00	89	0.20
Installation of Industrial Parkway Structure	Generator Sets	1	12.00	84	0.74
Installation of Industrial Parkway Structure	Off-Highway Trucks	2	12.00	46	0.45
Installation of Industrial Parkway Structure	Pumps	1	12.00	84	0.74
Installation of Industrial Parkway Structure	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Industrial Parkway Structure	Welders	0	8.00	46	0.45
Installation of Retaining Walls	Bore/Drill Rigs	2	12.00	221	0.50
Installation of Retaining Walls	Cranes	2	12.00	231	0.29
Installation of Retaining Walls	Forklifts	0	8.00	89	0.20
Installation of Retaining Walls	Generator Sets	0	8.00	84	0.74
Installation of Retaining Walls	Tractors/Loaders/Backhoes	0	7.00	97	0.37

Installation of Retaining Walls	Welders	0	8.00	46	0.45
Installation of Access Roadway and Cart Paths	Pavers	2	12.00	130	0.42
Installation of Access Roadway and Cart Paths	Paving Equipment	2	12.00	132	0.36
Installation of Access Roadway and Cart Paths	Rollers	2	12.00	80	0.38
Installation of Trackwork	Air Compressors	1	12.00	78	0.48
Installation of Trackwork	Cement and Mortar Mixers	1	12.00	9	0.56
Installation of Trackwork	Cranes	2	12.00	231	0.29
Installation of Trackwork	Dumpers/Tenders	2	12.00	16	0.38
Installation of Trackwork	Excavators	2	12.00	158	0.38
Installation of Trackwork	Generator Sets	1	12.00	84	0.74
Installation of Trackwork	Graders	1	12.00	187	0.41
Installation of Trackwork	Off-Highway Trucks	2	12.00	402	0.38
Installation of Trackwork	Pumps	2	12.00	84	0.74
Installation of Trackwork	Rubber Tired Dozers	1	12.00	247	0.40
Installation of Trackwork	Scrapers	2	12.00	367	0.48
Installation of Trackwork	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Gap Breaker Stations	Cranes	2	12.00	231	0.29
Installation of Gap Breaker Stations	Forklifts	0	8.00	89	0.20
Installation of Gap Breaker Stations	Generator Sets	0	8.00	84	0.74
Installation of Gap Breaker Stations	Off-Highway Trucks	4	12.00	402	0.38
Installation of Gap Breaker Stations	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Installation of Gap Breaker Stations	Welders	0	8.00	46	0.45
Installation of Train Control House	Cement and Mortar Mixers	1	12.00	9	0.56
Installation of Train Control House	Cranes	1	12.00	231	0.29
Installation of Train Control House	Dumpers/Tenders	1	12.00	16	0.38
Installation of Train Control House	Forklifts	0	8.00	89	0.20

Installation of Train Control House	Generator Sets	1	12.00	84	0.74
Installation of Train Control House	Graders	1	12.00	187	0.41
Installation of Train Control House	Off-Highway Trucks	2	12.00	402	0.38
Installation of Train Control House	Pumps	1	12.00	84	0.74
Installation of Train Control House	Tractors/Loaders/Backhoes	2	12.00	97	0.37
Installation of Train Control House	Welders	0	8.00	46	0.45
Bio Retention Basin	Excavators	2	12.00	158	0.38
Bio Retention Basin	Graders	1	12.00	187	0.41
Bio Retention Basin	Rubber Tired Dozers	1	12.00	247	0.40
Bio Retention Basin	Scrapers	2	12.00	367	0.48
Bio Retention Basin	Tractors/Loaders/Backhoes	2	12.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Clearing, Grubbing, and Site Grading	8	80.00	0.00	11,300.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Underground Stormwa	8	80.00	0.00	160.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Industrial Parkway Str	10	80.00	0.00	142.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Retaining Walls	4	80.00	0.00	652.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Access Roadway and Cart Pat	6	80.00	0.00	360.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Trackwork	19	80.00	0.00	800.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Gap Breaker Stations	6	80.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Installation of Train Control House	10	80.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Bio Retention Basin	8	80.00	0.00	700.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Clearing, Grubbing, and Site Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2745	0.0000	9.2745	4.9952	0.0000	4.9952			0.0000			0.0000
Off-Road	4.8272	48.5654	41.5842	0.0931		2.0031	2.0031		1.8429	1.8429		9,014.6230	9,014.6230	2.9155		9,087.5108
Total	**4.8272**	**48.5654**	**41.5842**	**0.0931**	**9.2745**	**2.0031**	**11.2776**	**4.9952**	**1.8429**	**6.8380**		**9,014.6230**	**9,014.6230**	**2.9155**		**9,087.5108**

3.2 Clearing, Grubbing, and Site Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5244	16.8260	4.5449	0.0749	1.8369	0.0294	1.8662	0.5026	0.0281	0.5307		7,977.6094	7,977.6094	0.3577		7,986.5511
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2289	0.1446	1.5111	5.3000e-003	0.6572	3.9600e-003	0.6611	0.1743	3.6500e-003	0.1780		528.3232	528.3232	0.0103		528.5797
Total	**0.7533**	**16.9706**	**6.0560**	**0.0802**	**2.4941**	**0.0333**	**2.5274**	**0.6769**	**0.0317**	**0.7087**		**8,505.9327**	**8,505.9327**	**0.3679**		**8,515.1309**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.1735	0.0000	4.1735	2.2478	0.0000	2.2478			0.0000			0.0000
Off-Road	4.8272	48.5654	41.5842	0.0931		2.0031	2.0031		1.8429	1.8429	0.0000	9,014.6230	9,014.6230	2.9155		9,087.5108
Total	**4.8272**	**48.5654**	**41.5842**	**0.0931**	**4.1735**	**2.0031**	**6.1766**	**2.2478**	**1.8429**	**4.0907**	**0.0000**	**9,014.6230**	**9,014.6230**	**2.9155**		**9,087.5108**

3.2 Clearing, Grubbing, and Site Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5244	16.8260	4.5449	0.0749	1.8369	0.0294	1.8662	0.5026	0.0281	0.5307		7,977.6094	7,977.6094	0.3577		7,986.5511
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2289	0.1446	1.5111	5.3000e-003	0.6572	3.9600e-003	0.6611	0.1743	3.6500e-003	0.1780		528.3232	528.3232	0.0103		528.5797
Total	**0.7533**	**16.9706**	**6.0560**	**0.0802**	**2.4941**	**0.0333**	**2.5274**	**0.6769**	**0.0317**	**0.7087**		**8,505.9327**	**8,505.9327**	**0.3679**		**8,515.1309**

3.2 Clearing, Grubbing, and Site Grading - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2745	0.0000	9.2745	4.9952	0.0000	4.9952			0.0000			0.0000
Off-Road	4.3519	41.9143	39.4966	0.0931		1.6963	1.6963		1.5606	1.5606		9,012.4222	9,012.4222	2.9148		9,085.2922
Total	**4.3519**	**41.9143**	**39.4966**	**0.0931**	**9.2745**	**1.6963**	**10.9708**	**4.9952**	**1.5606**	**6.5558**		**9,012.4222**	**9,012.4222**	**2.9148**		**9,085.2922**

3.2 Clearing, Grubbing, and Site Grading - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5194	16.5147	4.5252	0.0743	50.2403	0.0289	50.2692	12.3835	0.0277	12.4111		7,922.2552	7,922.2552	0.3562		7,931.1602
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2158	0.1312	1.3952	5.0800e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		506.7559	506.7559	9.2700e-003		506.9878
Total	**0.7352**	**16.6458**	**5.9204**	**0.0794**	**50.8974**	**0.0328**	**50.9303**	**12.5578**	**0.0313**	**12.5890**		**8,429.0111**	**8,429.0111**	**0.3655**		**8,438.1480**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.1735	0.0000	4.1735	2.2478	0.0000	2.2478			0.0000			0.0000
Off-Road	4.3519	41.9143	39.4966	0.0931		1.6963	1.6963		1.5606	1.5606	0.0000	9,012.4222	9,012.4222	2.9148		9,085.2922
Total	**4.3519**	**41.9143**	**39.4966**	**0.0931**	**4.1735**	**1.6963**	**5.8699**	**2.2478**	**1.5606**	**3.8085**	**0.0000**	**9,012.4222**	**9,012.4222**	**2.9148**		**9,085.2922**

3.2 Clearing, Grubbing, and Site Grading - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5194	16.5147	4.5252	0.0743	50.2403	0.0289	50.2692	12.3835	0.0277	12.4111		7,922.2552	7,922.2552	0.3562		7,931.1602
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2158	0.1312	1.3952	5.0800e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		506.7559	506.7559	9.2700e-003		506.9878
Total	**0.7352**	**16.6458**	**5.9204**	**0.0794**	**50.8974**	**0.0328**	**50.9303**	**12.5578**	**0.0313**	**12.5890**		**8,429.0111**	**8,429.0111**	**0.3655**		**8,438.1480**

3.3 Installation of Underground Stormwater Storage - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.2689	25.7723	31.2329	0.0819		1.0533	1.0533		0.9690	0.9690		7,922.6862	7,922.6862	2.5624		7,986.7451
Total	**3.2689**	**25.7723**	**31.2329**	**0.0819**		**1.0533**	**1.0533**		**0.9690**	**0.9690**		**7,922.6862**	**7,922.6862**	**2.5624**		**7,986.7451**

3.3 Installation of Underground Stormwater Storage - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0270	0.8574	0.2349	3.8600e-003	0.0934	1.5000e-003	0.0949	0.0256	1.4400e-003	0.0271		411.3029	411.3029	0.0185		411.7653
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2158	0.1312	1.3952	5.0800e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		506.7559	506.7559	9.2700e-003		506.9878
Total	**0.2428**	**0.9886**	**1.6301**	**8.9400e-003**	**0.7506**	**5.4000e-003**	**0.7560**	**0.1999**	**5.0300e-003**	**0.2050**		**918.0589**	**918.0589**	**0.0278**		**918.7531**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.2689	25.7723	31.2329	0.0819		1.0533	1.0533		0.9690	0.9690	0.0000	7,922.6862	7,922.6862	2.5624		7,986.7451
Total	**3.2689**	**25.7723**	**31.2329**	**0.0819**		**1.0533**	**1.0533**		**0.9690**	**0.9690**	**0.0000**	**7,922.6862**	**7,922.6862**	**2.5624**		**7,986.7451**

3.3 Installation of Underground Stormwater Storage - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0270	0.8574	0.2349	3.8600e-003	0.0934	1.5000e-003	0.0949	0.0256	1.4400e-003	0.0271		411.3029	411.3029	0.0185		411.7653
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2158	0.1312	1.3952	5.0800e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		506.7559	506.7559	9.2700e-003		506.9878
Total	**0.2428**	**0.9886**	**1.6301**	**8.9400e-003**	**0.7506**	**5.4000e-003**	**0.7560**	**0.1999**	**5.0300e-003**	**0.2050**		**918.0589**	**918.0589**	**0.0278**		**918.7531**

3.4 Installation of Industrial Parkway Structure - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5935	23.5848	27.0415	0.0534		0.9851	0.9851		0.9398	0.9398		5,090.4206	5,090.4206	0.9462		5,114.0758
Total	**2.5935**	**23.5848**	**27.0415**	**0.0534**		**0.9851**	**0.9851**		**0.9398**	**0.9398**		**5,090.4206**	**5,090.4206**	**0.9462**		**5,114.0758**

3.4 Installation of Industrial Parkway Structure - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.3500e-003	0.1384	0.0379	6.2000e-004	0.0151	2.4000e-004	0.0153	4.1300e-003	2.3000e-004	4.3600e-003		66.3693	66.3693	2.9800e-003		66.4439
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2158	0.1312	1.3952	5.0800e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		506.7559	506.7559	9.2700e-003		506.9878
Total	**0.2202**	**0.2695**	**1.4331**	**5.7000e-003**	**0.6723**	**4.1400e-003**	**0.6764**	**0.1785**	**3.8200e-003**	**0.1823**		**573.1253**	**573.1253**	**0.0123**		**573.4318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5935	23.5848	27.0415	0.0534		0.9851	0.9851		0.9398	0.9398	0.0000	5,090.4205	5,090.4205	0.9462		5,114.0758
Total	**2.5935**	**23.5848**	**27.0415**	**0.0534**		**0.9851**	**0.9851**		**0.9398**	**0.9398**	**0.0000**	**5,090.4205**	**5,090.4205**	**0.9462**		**5,114.0758**

3.4 Installation of Industrial Parkway Structure - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	4.3500e-003	0.1384	0.0379	6.2000e-004	0.0151	2.4000e-004	0.0153	4.1300e-003	2.3000e-004	4.3600e-003		66.3693	66.3693	2.9800e-003		66.4439
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2158	0.1312	1.3952	5.0800e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		506.7559	506.7559	9.2700e-003		506.9878
Total	**0.2202**	**0.2695**	**1.4331**	**5.7000e-003**	**0.6723**	**4.1400e-003**	**0.6764**	**0.1785**	**3.8200e-003**	**0.1823**		**573.1253**	**573.1253**	**0.0123**		**573.4318**

3.5 Installation of Retaining Walls - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5664	15.1001	11.3182	0.0458		0.5877	0.5877		0.5407	0.5407		4,428.2292	4,428.2292	1.4322		4,464.0337
Total	**1.5664**	**15.1001**	**11.3182**	**0.0458**		**0.5877**	**0.5877**		**0.5407**	**0.5407**		**4,428.2292**	**4,428.2292**	**1.4322**		**4,464.0337**

3.5 Installation of Retaining Walls - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0330	1.0482	0.2872	4.7200e-003	0.1648	1.8400e-003	0.1666	0.0437	1.7600e-003	0.0455		502.8178	502.8178	0.0226		503.3830
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2158	0.1312	1.3952	5.0800e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		506.7559	506.7559	9.2700e-003		506.9878
Total	**0.2488**	**1.1793**	**1.6824**	**9.8000e-003**	**0.8220**	**5.7400e-003**	**0.8277**	**0.2181**	**5.3500e-003**	**0.2234**		**1,009.5738**	**1,009.5738**	**0.0319**		**1,010.3708**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5664	15.1001	11.3182	0.0458		0.5877	0.5877		0.5407	0.5407	0.0000	4,428.2292	4,428.2292	1.4322		4,464.0337
Total	**1.5664**	**15.1001**	**11.3182**	**0.0458**		**0.5877**	**0.5877**		**0.5407**	**0.5407**	**0.0000**	**4,428.2292**	**4,428.2292**	**1.4322**		**4,464.0337**

3.5 Installation of Retaining Walls - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0330	1.0482	0.2872	4.7200e-003	0.1648	1.8400e-003	0.1666	0.0437	1.7600e-003	0.0455		502.8178	502.8178	0.0226		503.3830
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2158	0.1312	1.3952	5.0800e-003	0.6572	3.9000e-003	0.6611	0.1743	3.5900e-003	0.1779		506.7559	506.7559	9.2700e-003		506.9878
Total	**0.2488**	**1.1793**	**1.6824**	**9.8000e-003**	**0.8220**	**5.7400e-003**	**0.8277**	**0.2181**	**5.3500e-003**	**0.2234**		**1,009.5738**	**1,009.5738**	**0.0319**		**1,010.3708**

3.5 Installation of Retaining Walls - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5664	15.1001	11.3182	0.0458		0.5877	0.5877		0.5407	0.5407		4,428.2292	4,428.2292	1.4322		4,464.0337
Total	**1.5664**	**15.1001**	**11.3182**	**0.0458**		**0.5877**	**0.5877**		**0.5407**	**0.5407**		**4,428.2292**	**4,428.2292**	**1.4322**		**4,464.0337**

3.5 Installation of Retaining Walls - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0327	1.0300	0.2861	4.6800e-003	0.2610	1.8100e-003	0.2628	0.0673	1.7300e-003	0.0691		499.6690	499.6690	0.0225		500.2317
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2047	0.1198	1.2969	4.8900e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		487.8984	487.8984	8.4300e-003		488.1093
Total	**0.2374**	**1.1499**	**1.5830**	**9.5700e-003**	**0.9181**	**5.6000e-003**	**0.9237**	**0.2417**	**5.2100e-003**	**0.2469**		**987.5674**	**987.5674**	**0.0309**		**988.3410**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5664	15.1001	11.3182	0.0458		0.5877	0.5877		0.5407	0.5407	0.0000	4,428.2292	4,428.2292	1.4322		4,464.0337
Total	**1.5664**	**15.1001**	**11.3182**	**0.0458**		**0.5877**	**0.5877**		**0.5407**	**0.5407**	**0.0000**	**4,428.2292**	**4,428.2292**	**1.4322**		**4,464.0337**

3.5 Installation of Retaining Walls - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0327	1.0300	0.2861	4.6800e-003	0.2610	1.8100e-003	0.2628	0.0673	1.7300e-003	0.0691		499.6690	499.6690	0.0225		500.2317
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2047	0.1198	1.2969	4.8900e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		487.8984	487.8984	8.4300e-003		488.1093
Total	**0.2374**	**1.1499**	**1.5830**	**9.5700e-003**	**0.9181**	**5.6000e-003**	**0.9237**	**0.2417**	**5.2100e-003**	**0.2469**		**987.5674**	**987.5674**	**0.0309**		**988.3410**

3.6 Installation of Access Roadway and Cart Paths - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3727	12.8725	21.8670	0.0342		0.6278	0.6278		0.5776	0.5776		3,310.1177	3,310.1177	1.0706		3,336.8817
Paving	0.5127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8854**	**12.8725**	**21.8670**	**0.0342**		**0.6278**	**0.6278**		**0.5776**	**0.5776**		**3,310.1177**	**3,310.1177**	**1.0706**		**3,336.8817**

3.6 Installation of Access Roadway and Cart Paths - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0601	1.8958	0.5266	8.6200e-003	0.2101	3.3300e-003	0.2135	0.0576	3.1800e-003	0.0608		919.6361	919.6361	0.0414		920.6718
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2047	0.1198	1.2969	4.8900e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		487.8984	487.8984	8.4300e-003		488.1093
Total	**0.2648**	**2.0156**	**1.8235**	**0.0135**	**0.8673**	**7.1200e-003**	**0.8744**	**0.2320**	**6.6600e-003**	**0.2386**		**1,407.5345**	**1,407.5345**	**0.0499**		**1,408.7811**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3727	12.8725	21.8670	0.0342		0.6278	0.6278		0.5776	0.5776	0.0000	3,310.1177	3,310.1177	1.0706		3,336.8817
Paving	0.5127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.8854**	**12.8725**	**21.8670**	**0.0342**		**0.6278**	**0.6278**		**0.5776**	**0.5776**	**0.0000**	**3,310.1177**	**3,310.1177**	**1.0706**		**3,336.8817**

3.6 Installation of Access Roadway and Cart Paths - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0601	1.8958	0.5266	8.6200e-003	0.2101	3.3300e-003	0.2135	0.0576	3.1800e-003	0.0608		919.6361	919.6361	0.0414		920.6718
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2047	0.1198	1.2969	4.8900e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		487.8984	487.8984	8.4300e-003		488.1093
Total	**0.2648**	**2.0156**	**1.8235**	**0.0135**	**0.8673**	**7.1200e-003**	**0.8744**	**0.2320**	**6.6600e-003**	**0.2386**		**1,407.5345**	**1,407.5345**	**0.0499**		**1,408.7811**

3.7 Installation of Trackwork - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0909	0.0000	9.0909	4.9717	0.0000	4.9717			0.0000			0.0000
Off-Road	8.6313	75.1249	75.7312	0.1889		3.0295	3.0295		2.8369	2.8369		18,153.0742	18,153.0742	4.8670		18,274.7493
Total	**8.6313**	**75.1249**	**75.7312**	**0.1889**	**9.0909**	**3.0295**	**12.1205**	**4.9717**	**2.8369**	**7.8086**		**18,153.0742**	**18,153.0742**	**4.8670**		**18,274.7493**

3.7 Installation of Trackwork - 2026

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0132	0.4144	0.1151	1.8800e-003	0.0658	7.3000e-004	0.0665	0.0175	7.0000e-004	0.0182		201.0134	201.0134	9.0600e-003		201.2397
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2047	0.1198	1.2969	4.8900e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		487.8984	487.8984	8.4300e-003		488.1093
Total	**0.2179**	**0.5342**	**1.4120**	**6.7700e-003**	**0.7230**	**4.5200e-003**	**0.7275**	**0.1918**	**4.1800e-003**	**0.1960**		**688.9118**	**688.9118**	**0.0175**		**689.3490**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0909	0.0000	4.0909	2.2373	0.0000	2.2373			0.0000			0.0000
Off-Road	8.6313	75.1249	75.7312	0.1889		3.0295	3.0295		2.8369	2.8369	0.0000	18,153.0742	18,153.0742	4.8670		18,274.7493
Total	**8.6313**	**75.1249**	**75.7312**	**0.1889**	**4.0909**	**3.0295**	**7.1205**	**2.2373**	**2.8369**	**5.0742**	**0.0000**	**18,153.0742**	**18,153.0742**	**4.8670**		**18,274.7493**

3.7 Installation of Trackwork - 2026

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0132	0.4144	0.1151	1.8800e-003	0.0658	7.3000e-004	0.0665	0.0175	7.0000e-004	0.0182		201.0134	201.0134	9.0600e-003		201.2397
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2047	0.1198	1.2969	4.8900e-003	0.6572	3.7900e-003	0.6610	0.1743	3.4800e-003	0.1778		487.8984	487.8984	8.4300e-003		488.1093
Total	**0.2179**	**0.5342**	**1.4120**	**6.7700e-003**	**0.7230**	**4.5200e-003**	**0.7275**	**0.1918**	**4.1800e-003**	**0.1960**		**688.9118**	**688.9118**	**0.0175**		**689.3490**

3.7 Installation of Trackwork - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.0909	0.0000	9.0909	4.9717	0.0000	4.9717			0.0000			0.0000
Off-Road	8.6313	75.1249	75.7312	0.1889		3.0295	3.0295		2.8369	2.8369		18,153.0742	18,153.0742	4.8670		18,274.7493
Total	**8.6313**	**75.1249**	**75.7312**	**0.1889**	**9.0909**	**3.0295**	**12.1205**	**4.9717**	**2.8369**	**7.8086**		**18,153.0742**	**18,153.0742**	**4.8670**		**18,274.7493**

3.7 Installation of Trackwork - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0130	0.4071	0.1148	1.8700e-003	0.1065	7.2000e-004	0.1073	0.0275	6.9000e-004	0.0282		199.8302	199.8302	9.0200e-003		200.0558
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1940	0.1098	1.2098	4.7200e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		471.1298	471.1298	7.6800e-003		471.3219
Total	**0.2070**	**0.5169**	**1.3246**	**6.5900e-003**	**0.7637**	**4.3100e-003**	**0.7680**	**0.2018**	**3.9900e-003**	**0.2058**		**670.9600**	**670.9600**	**0.0167**		**671.3777**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0909	0.0000	4.0909	2.2373	0.0000	2.2373			0.0000			0.0000
Off-Road	8.6313	75.1249	75.7312	0.1889		3.0295	3.0295		2.8369	2.8369	0.0000	18,153.0742	18,153.0742	4.8670		18,274.7493
Total	**8.6313**	**75.1249**	**75.7312**	**0.1889**	**4.0909**	**3.0295**	**7.1205**	**2.2373**	**2.8369**	**5.0742**	**0.0000**	**18,153.0742**	**18,153.0742**	**4.8670**		**18,274.7493**

3.7 Installation of Trackwork - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0130	0.4071	0.1148	1.8700e-003	0.1065	7.2000e-004	0.1073	0.0275	6.9000e-004	0.0282		199.8302	199.8302	9.0200e-003		200.0558
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1940	0.1098	1.2098	4.7200e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		471.1298	471.1298	7.6800e-003		471.3219
Total	**0.2070**	**0.5169**	**1.3246**	**6.5900e-003**	**0.7637**	**4.3100e-003**	**0.7680**	**0.2018**	**3.9900e-003**	**0.2058**		**670.9600**	**670.9600**	**0.0167**		**671.3777**

3.8 Installation of Gap Breaker Stations - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.8039	26.7003	24.3222	0.0967		1.0186	1.0186		0.9371	0.9371		9,354.5313	9,354.5313	3.0254		9,430.1674
Total	**3.8039**	**26.7003**	**24.3222**	**0.0967**		**1.0186**	**1.0186**		**0.9371**	**0.9371**		**9,354.5313**	**9,354.5313**	**3.0254**		**9,430.1674**

3.8 Installation of Gap Breaker Stations - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1940	0.1098	1.2098	4.7200e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		471.1298	471.1298	7.6800e-003		471.3219
Total	**0.1940**	**0.1098**	**1.2098**	**4.7200e-003**	**0.6572**	**3.5900e-003**	**0.6608**	**0.1743**	**3.3000e-003**	**0.1776**		**471.1298**	**471.1298**	**7.6800e-003**		**471.3219**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.8039	26.7003	24.3222	0.0967		1.0186	1.0186		0.9371	0.9371	0.0000	9,354.5313	9,354.5313	3.0254		9,430.1674
Total	**3.8039**	**26.7003**	**24.3222**	**0.0967**		**1.0186**	**1.0186**		**0.9371**	**0.9371**	**0.0000**	**9,354.5313**	**9,354.5313**	**3.0254**		**9,430.1674**

3.8 Installation of Gap Breaker Stations - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1940	0.1098	1.2098	4.7200e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		471.1298	471.1298	7.6800e-003		471.3219
Total	**0.1940**	**0.1098**	**1.2098**	**4.7200e-003**	**0.6572**	**3.5900e-003**	**0.6608**	**0.1743**	**3.3000e-003**	**0.1776**		**471.1298**	**471.1298**	**7.6800e-003**		**471.3219**

3.9 Installation of Train Control House - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7921	31.0219	33.1424	0.0895		1.1802	1.1802		1.1131	1.1131		8,580.0813	8,580.0813	2.2064		8,635.2420
Total	**3.7921**	**31.0219**	**33.1424**	**0.0895**		**1.1802**	**1.1802**		**1.1131**	**1.1131**		**8,580.0813**	**8,580.0813**	**2.2064**		**8,635.2420**

3.9 Installation of Train Control House - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1940	0.1098	1.2098	4.7200e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		471.1298	471.1298	7.6800e-003		471.3219
Total	**0.1940**	**0.1098**	**1.2098**	**4.7200e-003**	**0.6572**	**3.5900e-003**	**0.6608**	**0.1743**	**3.3000e-003**	**0.1776**		**471.1298**	**471.1298**	**7.6800e-003**		**471.3219**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7921	31.0219	33.1424	0.0895		1.1802	1.1802		1.1131	1.1131	0.0000	8,580.0813	8,580.0813	2.2064		8,635.2420
Total	**3.7921**	**31.0219**	**33.1424**	**0.0895**		**1.1802**	**1.1802**		**1.1131**	**1.1131**	**0.0000**	**8,580.0813**	**8,580.0813**	**2.2064**		**8,635.2420**

3.9 Installation of Train Control House - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1940	0.1098	1.2098	4.7200e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		471.1298	471.1298	7.6800e-003		471.3219
Total	**0.1940**	**0.1098**	**1.2098**	**4.7200e-003**	**0.6572**	**3.5900e-003**	**0.6608**	**0.1743**	**3.3000e-003**	**0.1776**		**471.1298**	**471.1298**	**7.6800e-003**		**471.3219**

3.10 Bio Retention Basin - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.8993	0.0000	9.8993	5.0597	0.0000	5.0597			0.0000			0.0000
Off-Road	4.3519	41.9143	39.4966	0.0931		1.6963	1.6963		1.5606	1.5606		9,012.4222	9,012.4222	2.9148		9,085.2922
Total	**4.3519**	**41.9143**	**39.4966**	**0.0931**	**9.8993**	**1.6963**	**11.5957**	**5.0597**	**1.5606**	**6.6203**		**9,012.4222**	**9,012.4222**	**2.9148**		**9,085.2922**

3.10 Bio Retention Basin - 2027

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1738	5.4326	1.5313	0.0250	0.6130	9.5600e-003	0.6225	0.1681	9.1500e-003	0.1772		2,666.4846	2,666.4846	0.1204		2,669.4942
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1940	0.1098	1.2098	4.7200e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		471.1298	471.1298	7.6800e-003		471.3219
Total	**0.3678**	**5.5424**	**2.7411**	**0.0297**	**1.2701**	**0.0132**	**1.2833**	**0.3424**	**0.0125**	**0.3549**		**3,137.6144**	**3,137.6144**	**0.1281**		**3,140.8161**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.4547	0.0000	4.4547	2.2768	0.0000	2.2768			0.0000			0.0000
Off-Road	4.3519	41.9143	39.4966	0.0931		1.6963	1.6963		1.5606	1.5606	0.0000	9,012.4222	9,012.4222	2.9148		9,085.2922
Total	**4.3519**	**41.9143**	**39.4966**	**0.0931**	**4.4547**	**1.6963**	**6.1510**	**2.2768**	**1.5606**	**3.8375**	**0.0000**	**9,012.4222**	**9,012.4222**	**2.9148**		**9,085.2922**

3.10 Bio Retention Basin - 2027

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1738	5.4326	1.5313	0.0250	0.6130	9.5600e-003	0.6225	0.1681	9.1500e-003	0.1772		2,666.4846	2,666.4846	0.1204		2,669.4942
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1940	0.1098	1.2098	4.7200e-003	0.6572	3.5900e-003	0.6608	0.1743	3.3000e-003	0.1776		471.1298	471.1298	7.6800e-003		471.3219
Total	**0.3678**	**5.5424**	**2.7411**	**0.0297**	**1.2701**	**0.0132**	**1.2833**	**0.3424**	**0.0125**	**0.3549**		**3,137.6144**	**3,137.6144**	**0.1281**		**3,140.8161**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Unrefrigerated Warehouse-Rail	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.565681	0.036493	0.190146	0.103622	0.013041	0.005087	0.026037	0.049339	0.002262	0.001910	0.005350	0.000375	0.000655
Other Non-Asphalt Surfaces	0.565681	0.036493	0.190146	0.103622	0.013041	0.005087	0.026037	0.049339	0.002262	0.001910	0.005350	0.000375	0.000655
Unrefrigerated Warehouse-Rail	0.565681	0.036493	0.190146	0.103622	0.013041	0.005087	0.026037	0.049339	0.002262	0.001910	0.005350	0.000375	0.000655

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4674	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Unmitigated	0.4674	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0962					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3710					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-004	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Total	**0.4674**	**2.0000e-005**	**2.2200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**4.7700e-003**	**4.7700e-003**	**1.0000e-005**		**5.0800e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0962					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.3710					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-004	2.0000e-005	2.2200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.7700e-003	4.7700e-003	1.0000e-005		5.0800e-003
Total	**0.4674**	**2.0000e-005**	**2.2200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**4.7700e-003**	**4.7700e-003**	**1.0000e-005**		**5.0800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX C

BIOLOGICAL RESOURCES STUDY

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San Francisco Bay Area Rapid Transit District

Hayward Maintenance Complex (Phase 2) Project

Biological Resources Study

San Francisco Bay Area Rapid Transit District

City of Hayward

Alameda County, California

June 2022

Prepared for:

Prepared by:

Summary

The San Francisco Bay Area Rapid Transit District (BART) proposes to construct the Hayward Maintenance Complex Phase 2 Project (HMC2 Project or Project), an element of the HMC Project, which was environmentally evaluated in the 2011 Initial Study/Mitigated Negative Declaration. The HMC2 Project is subdivided into two major components, the East Storage Yard and the Northern Mainline Connector. This *Biological Resources Study* (BRS) provides technical information about potential impacts of the Project on biological resources in compliance with the National Environmental Policy Act (NEPA) and CEQA.

As part of the environmental analysis, a Biological Study Area (BSA) was established around the proposed Project limits and an additional 50-foot buffer zone in order to determine potential indirect impacts, such as noise and air quality issues that may be generated by Project-related activities. Biological resources surveys, including wildlife and botanical surveys, and aquatic resources delineations were conducted in the BSA in 2019, 2020, and 2021.

The BSA consists of annual grassland, the BART facilities, and the Mission Hills of Hayward Golf Course Driving Range surrounded entirely by urban habitat and associated commercial and residential structures, paved roadways, and ornamental landscaped vegetation. Wetlands and waters of the State are also present within the BSA. The total area of the BSA is 170.68 acres (7,434,820 sq ft.).

A total of 40 special-status wildlife species (including federally listed and state listed) and regulated habitats have potential to occur within a 5-mile radius of the BSA. Based on the evaluation conducted for this BRS, the following special-status species have the potential to occur.

Common Name	Scientific Name	Listing Fed/State	Potential for Occurrence
Western burrowing owl	*Athene cunicularia*	--/SSC	Low
White-tailed kite	*Elanus leucurus*	--/FP	High
Migratory Birds	N/A	MBTA/FGC sections 3503 and 3800	High
Pallid Bat	*Antrozous pallidus*	SSC	Low
Roosting Bats	N/A	--/FGC sections 2000, 2002, 2014, 4150 CCR 251.1	Low

Legend:
SCE = State Candidate Endangered
SSC = State Species of Special Concern
FP = State Fully Protected
MBTA = Migratory Bird Treaty Act
FGC = Fish and Game Code
CCR = California Code of Regulations

Several Avoidance and Minimization Measures (AMM) are recommended in order to comply with regulations protecting biological resources. These AMMs include, but are not limited to:

- If Project-related work occurs during the bird nesting season (February 1 – August 31), pre-construction nesting bird surveys will be conducted. If an active bird nest is identified, a protective buffer will be established around the nest. The standard buffer will be 50 feet for passerines (songbirds) and 300 feet for raptors (birds of prey). If it becomes necessary for work to occur in closer proximity to a nest, the Project biologist will develop a nest monitoring plan for submittal to BART. The plan will include continual monitoring of the nest as construction moves closer. If at any time the biologist determines that activities may cause nest abandonment, construction activity in that area will cease.

- Conducting Worker Environmental Awareness Training regarding potential sensitive species that could occur in or near the BSA, such as burrowing owl, white-tailed kite, and migratory birds

The total impacts to wetlands would be 0.652 ac (28,401 sq. ft). No impacts to non-wetland waters of the U.S. are anticipated. Total impacts to waters of the State would be 0.798 ac (34,758 square feet) and 4,991 linear feet. Total impacts to riparian habitat would be 0.009 ac (337 sq. ft) and 18 linear feet. These impacts would require compensatory mitigation. BART is in the process of locating mitigation that would be suitable to the United States Army Corps of Engineers (USACE), the Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Wildlife (CDFW).

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List of Abbreviated Terms

ac	acre
AJD	Approved Jurisdictional Determination
AMM	Avoidance and Minimization Measures
AMSL	above mean sea level
BART	Bay Area Rapid Transit
BMPs	best management practices
BRS	Biological Resources Study
BSA	Biological Study Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships System
ESA	Environmentally Sensitive Area
FGC/F.G.C.	Fish and Game Code
FP	Fully Protected
FESA	Federal Endangered Species Act
HARD	Hayward Area Recreation District
HMC	Hayward Maintenance Complex
HMC2 Project	Hayward Maintenance Complex (Phase 2) Project
IS/MND	Initial Study/Mitigated Negative Declaration
MBTA	Migratory Bird Treaty Act
MLRA	Major Land Resource Area
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PJD	Preliminary Jurisdictional Determination
Project	Hayward Maintenance Complex (Phase 2) Project
PW	Potential Wetland
RWQCB	Regional Water Quality Control Board
sq. ft	square feet
SR	State Route
SSC	Species of Special Concern

SUGGRO	Soil Survey Geographic Database
SWPPP	Storm Water Pollution Prevention Plan
TNW	Traditional Navigable Water
TPSS	Traction Power Substation
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WETS	Wetlands Climate Tables
WDR	Waste Discharge Requirements

Chapter 1 Introduction

The San Francisco Bay Area Rapid Transit District (BART) proposes to construct the Hayward Maintenance Complex (HMC) Phase 2 Project (HMC2 Project or Project), an element of the HMC Project, which was environmentally evaluated in the 2011 Initial Study/Mitigated Negative Declaration (IS/MND).

The purpose of this Biological Resources Study (BRS) is to provide technical information and to determine the extent to which the Project may affect special-status species, their habitats, and other natural areas in accordance with the National Environmental Policy Act (NEPA) and CEQA. Avoidance and minimization measures (AMM) are included in this document to demonstrate that BART has given biological resources due consideration while planning the Project.

1.1 Project Location

The Project is located within the City of Hayward and is situated west of State Route (SR) 238 (Mission Blvd). The HMC extends, parallel to the BART tracks between Whipple Road and Industrial Parkway. See Figure 1 for the Project location and Figure 2 for the Project vicinity.

Figure 1. Project Location

Source: WRECO, 2022

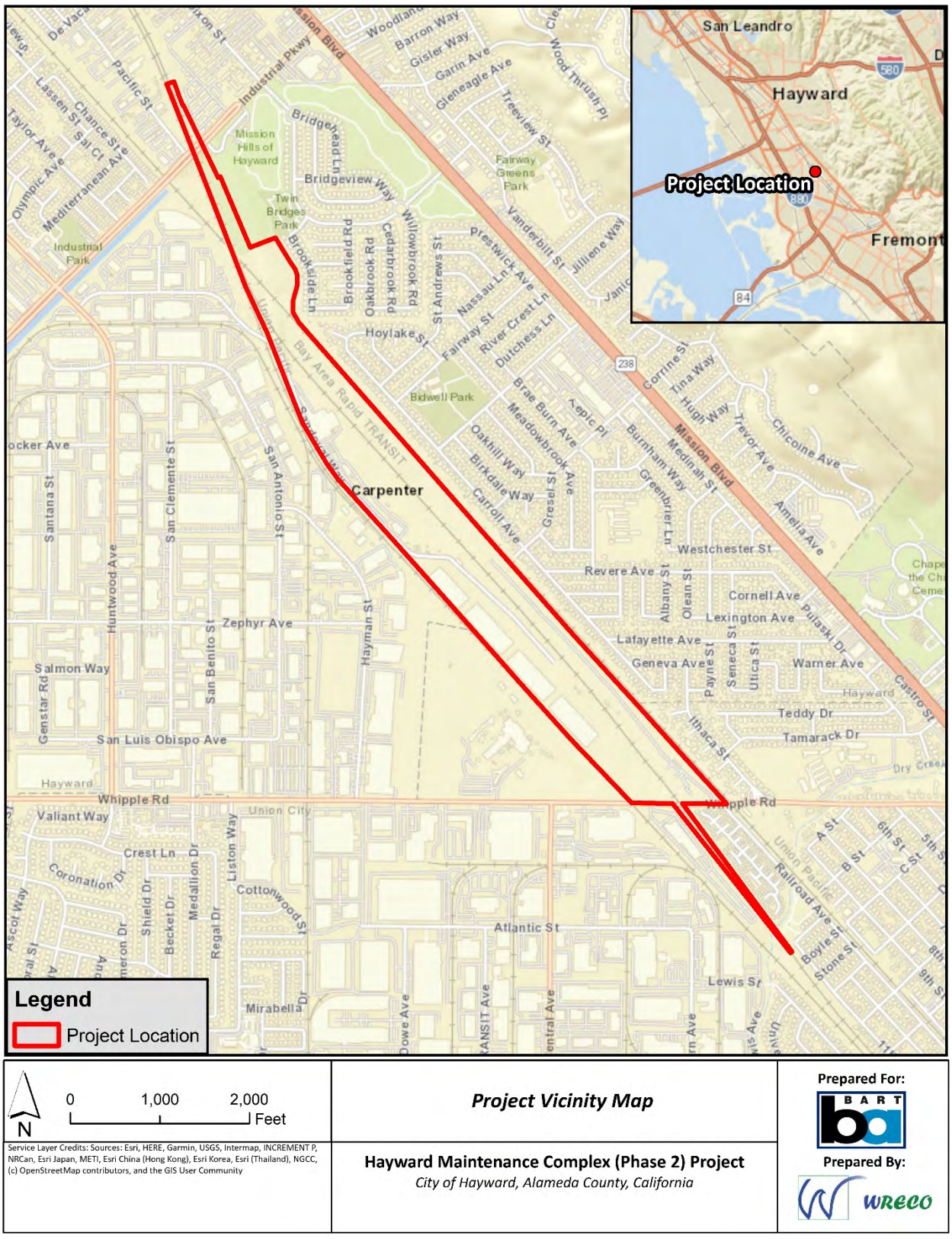

Figure 2. Project Vicinity

Source: WRECO, 2022

1.2 Project Description

The following describes the proposed Hayward Maintenance Complex (Phase 2) Project (HMC2 Project or Project) that would include development of key features within the East Storage Yard and construction of the Northern Mainline Connector to provide a new trackway connection between the East Storage Yard and the Bay Area Rapid Transit (BART) mainline trackway. BART is both the Project proponent and the Lead Agency for review of the proposed Project under CEQA.

1.2.1 Project Purpose and Need

BART has been in operation since 1972 and currently operates in five Bay Area counties. It operates and maintains 131 miles of revenue track and 50 stations serving an average of 405,000 passenger trips on an average weekday (prior to the COVID-19 pandemic). The most recent extension to the BART system was to the Berryessa/North San Jose Station in San Jose, which opened in June 2020.

The BART fleet has 669 legacy revenue vehicles and has ordered 775 "Fleet of the Future" cars. The first Fleet of the Future train carried passengers in January 2018. The size of BART's fleet will be dynamic while new trains are put into service and old trains are retired. The current forecast indicates the balance of new train cars will be delivered by Spring 2022.[1] Approximately 620 vehicles are in service on a typical day.

BART's current fleet of 728 revenue vehicles can all be stored within the four existing yards associated with the four vehicle maintenance shops. As the fleet expands to meet future needs, additional maintenance and storage will be necessary, both to accommodate the expected number of cars and to minimize non-revenue train movements to initiate and end daily service.

Maintenance will also need to be expanded to ensure future reliability and performance. BART has instituted a Strategic Maintenance Program that will provide scheduled maintenance and overhauls for the vehicle fleet. The acquisition of the three properties (with four warehouses) adjacent to Hayward Yard (HMC Phase 1) created an efficient complex that could provide the necessary maintenance and also allow a consolidation of existing BART services.

As part of the Transbay Corridor Core Capacity Program, BART has prioritized three interrelated capital investment initiatives to ensure the system can safely, efficiently, and

[1] San Francisco Bay Area Rapid Transit District (BART), 2021. "System Facts" website: www.bart.gov/about/history/facts (accessed July 30, 2021).

comfortably serve current and new riders. Collectively these projects are known as the "Big 3" and include the following:

- The Fleet of the Future – Replacement and expansion of its fleet size through procurement of new Fleet of the Future train cars. BART will replace its legacy fleet which consists of 669 cars with 775 new Fleet of the Future cars. This project is currently underway.

- Communications Based Train Control – An improved train control system to enable trains to operate more frequently.

- HMC Phase 2 Project (HMC2 Project) – Expansion of the HMC to provide new train maintenance facilities and a new train storage yard east of the existing yard. The expanded HMC would ensure that BART's maintenance and repair capacity is sufficient to support the new railcar fleet for both the current system and system expansions.

The "Big 3" together address some key current bottlenecks that hinder BART's ability to meet pre-pandemic and forecasted future ridership growth. The HMC2 Project consists of both the East Storage Yard and the Northern Mainline Connector. These projects are located on the undeveloped land east of the Hayward Maintenance Complex and would provide an economical means to expand vehicle storage on suitable, vacant land, which BART already owns.

1.2.1.1 PROJECT OBJECTIVES

The objectives for the proposed Project are to:

- Provide additional storage tracks for approximately 250 additional BART cars.

- Provide increased flexibility for BART operations by allowing some maintenance operations that now occur on the west side of the mainline to be conducted at the East Storage Yard.

- Increase flexibility for BART operations by providing a direct and efficient rail connection from the East Storage Yard to the BART northbound mainline via the Northern Mainline Connector.

1.2.2 Proposed Project

BART proposes to construct the HMC2 Project, an element of the HMC Project, which was environmentally evaluated in the 2011 IS/MND. The HMC2 Project is subdivided into two major components, the East Storage Yard and the Northern Mainline Connector.

1.2.3 East Storage Yard

The East Storage Yard, the first component of the HMC2 Project, includes a vehicle storage yard capable of storing approximately 250 BART vehicles. The need for the East Storage Yard is driven by BART's plan to increase its fleet size to accommodate a growing demand for reliable and more frequent train service to/from downtown San Francisco and Oakland.

The East Storage Yard also features ancillary wayside and maintenance facilities needed for a fully functional, electrified, storage yard. The East Storage Yard was evaluated under CEQA in 2011; however, several key features were not fully addressed or developed in the 2011 IS/MND. These features, along with the Northern Mainline Connector component, form the basis of the proposed Project. Figure 6 in Appendix A shows the East Storage Yard Project Components. Key features of the East Storage Yard are as follows:

- **Drainage.** An existing open drainage channel that extends the length of the proposed East Storage Yard and the existing rail storage yard and maintenance facilities almost to Whipple Road would be filled. The length of the fill would be approximately 4,781 linear feet, and the surface area of the fill would be approximately 33,102 square feet (0.76 acres). The amount of fill required would be approximately 18,900 cubic yards. Replacement of the drainage channel is needed for the construction of a perimeter access road, which would provide for maintenance and emergency vehicles egress through the storage yard.

  A second drainage ditch, which originates in the middle of the yard and directs flow towards the western boundary of the HMC, would be partially filled to accommodate construction of the pedestrian/golf cart bridge crossing. The length of fill would be approximately 210 linear feet and the surface area of fill would be approximately 1,656 square feet (0.038 acre).

- **Car Cleaning Platform.** A car cleaning platform would be provided within the storage yard. The car cleaning platform would allow car cleaners to access trains at vehicle door height, similar to typical passenger platforms. Canopies, mop sinks, and storage cabinets would also be provided along the cleaning platform. The dimensions of the platform would be approximately 700 feet long by 11 feet wide.

- **Cart Bridge Overcrossing.** An overcrossing structure would provide access for personnel carts and pedestrians to allow workers to traverse between the East Storage Yard and the existing Hayward Yard. The cart bridge overcrossing would be approximately 780 feet long and 20 feet above the ground.

- **Extension of Whistle Stop Structure.** The existing Whistle Stop Structure would be extended to the east to allow Train Operators to cross over the Hayward Test Track and access the East Storage Yard. The Whistle Stop Structure would also allow for additional

pedestrian movement between the existing Hayward Yard and the East Storage Yard area. The Whistle Stop Structure would be approximately 100 feet long by 5 feet wide.

- **Traction Power Substation.** A Traction Power Substation (TPSS) would be located in the East Vehicle Storage Yard. The TPSS would provide power to the storage yard. The dimensions of the TPSS would be 180 feet long by 70 feet wide by 12 feet high.

- **Train Operator Facility/Car Cleaner/Cart Charging Facility.** A two-story administrative building would provide work and break facilities for Car Cleaners and Train Operators. The facility would be located on the south end of the East Storage Yard and would also include facilities to allow for the charging of electric carts. The facility would be approximately 8,600 square feet and 12 feet long by 40 feet wide by 32 feet high.

- **Ditch Restoration.** The East Storage Yard component would include a narrow linear area approximately 500 feet long located within the Hayward Maintenance Complex that is bounded by Sandoval Way on the east and the Union Pacific Railroad (UPRR) Oakland Subdivision rail line on the west, which could accommodate proposed restoration of an existing ditch as mitigation for wetland impacts, if needed.

1.2.4 Northern Mainline Connector

The Northern Mainline Connector would consist of a new trackway connection between the East Storage Yard and the BART mainline trackway. The Northern Mainline Connector would be located on approximately 25 acres of undeveloped property located in the northeast corner of the Hayward Yard, extending along the BART right-of-way north of Industrial Parkway.

The Northern Mainline Connector area would be bounded by the UPRR Niles Subdivision rail line and Mission Hills of Hayward Golf Course Driving Range on the east, the BART Mainline and Hayward Test Track to the west, and the East Storage Yard to the south.

The Northern Mainline Connector would also include the relocation of the western fence of the Mission Hills of Hayward Golf Course Driving Range (driving range) to a location further to the east to allow for the construction of new trackway. Key features of the Northern Mainline Connector are shown in Figure 7 in Appendix A and described as follows:

- **Extended Trackway.** The BART tracks would be extended from the vehicle storage area north approximately 3,600 feet, to a point approximately 700 feet north of Industrial

Parkway. A combination of turnouts and crossovers[2] would be installed, including three crossovers and eight turnouts that are north of the vehicle storage yard.

- **Retained Fill Embankment.** A retained fill embankment would be constructed to carry the connecting tracks north from the storage tracks to the UPRR tunnel and from the UPRR tunnel to approximately 700 feet north of Industrial Parkway. The retained fill embankment would be approximately 3,600 feet (0.68 miles) long, 25 to 50 feet wide, and 25 feet at the highest location. Between the UPRR tracks on the east and the BART test track on the west, the embankment would be constructed between two retaining walls and would carry a series of tracks from the East Storage Yard that would converge to just one track connecting to the BART mainline north of Industrial Parkway. The embankment would also carry a service road parallel to the tracks. The embankment would be lighted with shielded security lights 15 to 18-feet high.

- **Bridge over Industrial Parkway.** A new bridge structure would be constructed over Industrial Parkway to carry the new Northern Mainline Connecter trackway. The structure would be approximately 230 feet long, 25 feet wide, and 25 feet high and would be supported by columns placed in the median and either side of the roadway.

- **Soundwall.** A 600-foot long, 10-foot high sound wall (5-feet above track top of rail) would be constructed along the east side the Northern Mainline Connector tracks north of Industrial Parkway as mitigation for noise impacts associated with construction of nearby crossovers (see Section 5.13, Noise).

- **Drainage.** Underground culvert pipes would replace portions of an existing open culvert/linear-ditch along the west side of Northern Mainline Connector site to allow for the construction of a perimeter access road, which will provide access for emergency vehicles throughout the storage yard and to accommodate a Gap Breaker Station and a Train Control House.

- **Bioretention Basin.** A bioretention basin would be located between the retained fill embankment on the east and the BART test tracks on the west. Its dimensions would be approximately 580 feet long by approximately 50 feet wide by 4 feet deep. The bioretention basin would have an area of approximately 29,000 square feet and a capacity of approximately 44,000 cubic feet of stormwater storage. Flows from the Phase 1 (west side of

[2] A crossover is defined as a pair of switches that connects two parallel rail tracks, allowing a train on one track to cross over to the other. A turnout is a mechanical device used to guide the trains from one rail track to another.

Hayward maintenance yard) and Phase 2 (East Side Storage Area) would be conveyed by gravity into the bioretention basin.

- **Stormwater Storage.** In addition to the bioretention basin, the proposed Project would include stormwater storage to accommodate runoff from the Phase 1 area (west side of the mainline tracks) of the Hayward Yard. Stormwater from the Phase 1 area would be conveyed to storage culverts beneath the proposed bioretention basin. The storage facility would consist of four side-by-side box culverts that would be cross-connected to act as a single storage unit. The combined culvert dimensions would be approximately 40 feet wide by 8 feet deep by 400 feet long and would provide approximately 100,000 cubic feet of storage. Stormwater runoff from the Phase 1 site would flow to a bypass structure on the site, where the Phase 1 flows would be stored in the box culverts and excess storm flows would be conveyed to an existing outfall.[3] Once a storm event has passed and there is capacity in the bioretention basin, a pump station would lift the Phase 1 flows into the bioretention basin for treatment and eventual discharge to an existing outfall on the eastern side of the UPRR tracks. Pump stations and piping for this component would be provided as part of the proposed Project.

- **Jack and Bore 30-Inch Storm Drain**. A 30-inch storm drain culvert would be installed via jack and bore underneath the UPRR Niles Subdivision tracks to connect to an existing culvert east of the UPRR tracks. The existing culvert outlets to an Alameda County Flood Control and Water Conservation District (ACFCWD) channel. Approximately 200 feet of the storm drain would be jacked and bored. The existing drainage outfall to the ACFCWD channel would not be impacted by construction activities.

- **Jack and Bore Sanitary Sewer**. An 8-inch sanitary sewer would be installed via jack and bore underneath the UPRR Oakland Subdivision, BART Hayward Test Track, and BART mainline trackways to connect to provide a connection to an existing sanitary sewer system located on Sandoval Way.

- **Underground Utilities.** Power, water, sanitary sewer, and communications would be extended from the existing connections to the expansion area.

[3] The Regional Water Quality Control Board requires treatment to the 85th percentile of stormwater volume.

- **Traction Power, Train Control, and Communications Systems.** Embedded electrical conduit for traction power would be provided for power and communications circuits. A third rail to provide power to tracks and to power the vehicles would be installed.

- **Gap Breaker Stations**. Two gap breaker stations, one at the north end of the connecting tracks adjacent to the east side of the BART tracks north of Industrial Parkway and another at the south end of the Northern Mainline Connector tracks would be installed. These facilities would be approximately 1,000 square feet in size and provide for continuity in and the ability to isolate sections of contact rail. The gap breaker stations would be approximately 56 feet long by 20 feet wide by 13 feet high.

- **Train Control House.** A train control house would be located at the south end of the Northern Connector where the storage tracks start to merge. This facility would be approximately 3,800 square feet in size and would house automatic train control equipment. The train control house would be approximately 126 feet long by 30 feet wide by 18 feet high.

- **Access Road.** A new 20-foot-wide paved road would extend along the east side of the storage tracks to a point just north of the current wetlands area. This extension of the planned road would extend from the East Storage Yard towards the northern transfer tracks. It would provide for both BART and fire and emergency access to the proposed Project area.

- **Relocation of Driving Range Fence.** Construction of the track for the Northern Mainline Connector would require the relocation of the boundary fence between the driving range and the BART tracks. The property is owned by BART, but the Hayward Area Recreation and Park District (HARD) has a permanent operating easement for the property for the operation of the driving range. The relocation would shift the boundary fence a maximum of approximately 50 feet to the east along 1,310 feet (the full length of the driving range). Approximately 61,444 square feet (1.41 acres) of property would be affected. The boundary shift would require BART and HARD to extinguish a portion of the existing operating easement.

- **Wetland Mitigation Area.** Approximately 2.24 acres of the undeveloped HARD property south of the driving range is being considered for conversion to a permanent wetland area as mitigation for the loss of wetlands on site. Development of wetlands would follow use of this area as the Secondary Staging Area during construction.

- **Train Wash**. A train wash facility would be constructed at the south end of the Northern Mainline Connector tracks, just north of the vehicle storage area. The train wash would allow BART to clean the exteriors of trains as they enter the storage yard following the completion

of revenue service. The train wash would be approximately 200 feet long by 30 feet wide by 14 feet high.

- **Site Lighting.** Light poles for security lighting would be added along the new trackway. Light poles would be 15 to 18 feet high with shielded lamps. The new lights would not include motion detectors.

- **Perimeter Fence.** A 9-foot-high security fence would be provided along the new perimeter of the expansion area topped with razor coil adding 12 inches in height.

1.2.5 Train Activity

With implementation of the proposed Project, an increased level of train activity in the proposed Project area would occur, as many as 12 trains could be dispatched from the east side storage tracks and use the Northern Mainline Connector to join the northbound mainline in the morning and return at the end of the operating day. Train movements in the connecting tracks would range from 5 to 30 miles per hour as trains prepared to merge with mainline train traffic.

1.2.6 Employees

BART activities vary by time of day, and the number of employees at the Hayward Yard increases or decreases depending on various BART operations and maintenance activity occurring at the time. Currently, approximately 370 BART employees work at the Hayward Yard in a given day (24 hours), distributed over several shifts. No new activities are planned at the new storage area. Rather, the new storage area would provide additional car storage capacity and increased operational flexibility for existing activities.

Though designed primarily for train storage, the new storage area is designed to allow train operations on the west side of the yard (such as train dispatch) to expand to the east side expansion area at some time in the future.

1.2.7 Project Construction

It is estimated that construction activities would commence in Summer 2024 and extend through Spring 2028. Typical construction equipment would consist of dump trucks, self-propelled earth-scrapers, water trucks, bulldozers, grade-alls, cranes, loaders, excavators, rollers, lubrication/fueling service trucks, transit-mix concrete trucks, concrete pumps, and diesel-driven generators, specialized truck trailers, and compressed air units for construction power, equipment, and tools. Construction equipment for mainline track tie-in work would consist of excavators, loaders, trucks with high-rail equipment and ballast tamper. Conventional construction equipment can also be brought to the site via BART flat-bed cars.

Construction activities would be phased and include site grading, and construction of embankment and retaining walls, drainage improvements, underground utilities, access roads, new railroad track, gap breaker stations, a substation, miscellaneous train operator and car cleaner facilities, a train wash, and system components such as signals, as described further below. The duration of each phase would vary. Each phase would require different types of construction equipment and result in varying levels of imported/exported material; therefore, the number of vehicle trips associated with Project construction would vary by phase. Overall, the HMC2 Project is anticipated to result in approximately 14,434 truck trips over the approximately 3.5-year construction period.

1.2.7.1 CONSTRUCTION STAGING AREAS

The primary construction staging area would be located in an area immediately to the south of the Project site, in an area that would become the East Storage Area. This area would be used to stage construction equipment, contractor offices, and construction materials.

A secondary staging area would be included on the east side of the UPRR (Niles Subdivision) trackway and south of the driving range on a parcel that is currently owned by HARD (Figure 10). This 3-acre, secondary staging area is accessible from Mission Boulevard via Gresel Street and the UPRR right-of-way and would provide an area for the contractor to stage materials and construction equipment east of the UPRR trackway.

Construction staging would also occur on the driving range. A temporary construction easement would be established along the westernmost portion of the driving range parallel to the new retained fill embankment. The construction easement would extend approximately 130 feet onto the driving range, occupying approximately 89,500 square feet. The construction easement would be in place for approximately 14 months, while the new embankment and trackway is constructed.

1.2.7.2 CONSTRUCTION SITE ACCESS

Construction access to the Project site would be accomplished through 3 possible routes: 1) by way of the existing BART gate at Whipple Road (951 Whipple Road), 2) by way of Industrial Parkway through the driving range parking area, and 3) by way of Mission Blvd through Gresel Street, a local neighborhood roadway. This third route would also traverse through UPRR owned property.

Access Route 1, through Whipple Road, would likely be utilized for the full Project construction duration, estimated at four years. Access Route 2, though Industrial Parkway, would likely be utilized for 13 months. Access Route 3, through Gresel Street and the UPRR owned property,

would likely be utilized during construction of the proposed retaining wall, located adjacent to the driving range, estimated at 13 months, as well.

1.2.7.3 CLEARING, GRUBBING, AND SITE GRADING

As the first order of work, the 6 acres (entire footprint of the Northern Mainline Connector) of undeveloped land for the Northern Mainline Connector would be cleared and grubbed of topsoil material. Approximately 4 to 6 inches of topsoil and organic material would be removed and transported from the Project site. This activity would be followed by site grading where excavation will occur to accommodate below grade stormwater storage and imported fill material will be brought to the site via trucks to build up the trackway embankment.

Roughly 84,700 cubic yards of import material would be needed for this work, including 10 percent additional material to account from shrinkage due to the compaction of soils. Assuming an average truck capacity of 15 cubic yards per truck, approximately 5,650 truckloads (or 11,300 truck trips) would be generated through clearing, grubbing, importation of fill, and grading activities. It is estimated that the clearing, grubbing, fill, and grading activities would take 110 working days to complete. In general, this work would be conducted away from BART's fenced active trackway area. It is expected that the clearing, grubbing, and grading work would generate approximately 51 truckloads (or 102 truck trips) per day. Approximately 70 percent of construction traffic (36 truckloads/72 truck trips) would likely traverse along the main construction access road to Whipple Road, while the remaining traffic (15 truckloads/30 truck trips) would traverse along the secondary construction access road to Gresel Street.

1.2.7.4 INSTALLATION OF UNDERGROUND STORMWATER STORAGE STRUCTURE

An underground stormwater storage structure would be installed below the bioretention area located between the retained fill trackway and the Hayward Test Track. The underground storage structure would be composed of precast reinforced concrete box culverts connected with an equalizer pipe composed of reinforced concrete pipe segments. A pump station would also be installed adjacent to the underground storage structure to allow stormwater to be pumped up and into the bioretention area. This work would require the use of cranes, excavators, loaders, and flat-bed trucks.

The underground stormwater structure and pump station would be composed of predominantly precast parts which would be manufactured off site. The precast materials would be delivered to site via flatbed trucks. It is anticipated that this work would generate approximately 80 truckloads (or 160 truck trips). This work is anticipated to take roughly 30 days to complete. Construction traffic for this portion of the Project would likely use the main construction access road to Whipple Road.

1.2.7.5 INSTALLATION OF INDUSTRIAL PARKWAY STRUCTURE

A new track overcrossing structure would be constructed over Industrial Parkway. The structure type has not been selected. A Type, Size, and Location or preliminary report will be prepared to aid in the selection of the structure.

Should the structure type consist of reinforced and post-tensioned concrete approximately 675 cubic yards of concrete would need to be delivered to the Project site. Assuming an average concrete truck capacity of 9.5 cubic yards per truck, 71 truckloads (or 142 truck trips) would be generated throughout overcrossing structure construction activities. Industrial Parkway Overcrossing construction would take approximately 165 working days to complete. Construction traffic required for this Project component would likely access the site via Industrial Parkway.

Temporary realignments of vehicular traffic lanes on Industrial Parkway may be necessary to allow for the erection of falsework during the construction of the overcrossing structure.

1.2.7.6 INSTALLATION OF RETAINING WALLS

Retaining walls would be constructed using two methods depending on location. A proposed retaining wall north of Industrial Parkway (adjacent to Gap Breaker Station AZE) would be a soldier pile-type retaining wall. This work would require the use of impact and/or vibratory pile drivers, cranes, and drilling rigs. Cast-in-place retaining walls would be constructed elsewhere following clearing, grubbing, and grading activities and would take place along the eastern limits of the Project from Industrial Parkway south to the UPRR Niles Subdivision tunnel structure. South of the UPRR tunnel retaining walls would be constructed on either side of the proposed trackway using cast-in-place technology.

Materials needed for the proposed retaining walls would include approximately 3,100 cubic yards of concrete that would need to be delivered to the Project site. Assuming an average concrete truck capacity of 9.5 cubic yards per truck, 326 truckloads (or 652 truck trips) would be generated throughout retaining wall construction activities. Retaining wall construction would take approximately 100 working days to complete. Approximately 60 percent of construction traffic (196 truckloads/392 truck trips) required for this activity would likely utilize the main construction access road to/from Whipple Road, while the remaining traffic (130 truckloads/260 truck trips) would likely utilize the secondary construction access road to/from Gresel Street.

1.2.7.7 INSTALLATION OF ACCESS ROADWAY AND CART PATHS

Following the installation of retaining walls, construction of the access roadway and cart paths would commence. An access road is proposed along the northern mainline connector trackway and a cart path for maintenance is proposed between the northern transfer tracks. These

roadways would consist of aggregate base rock material and hot mix asphalt concrete. The roadway/cart path construction work would require 2,700 cubic yards of asphalt and aggregate base rock material. Bringing this material to the Project site and would generate 180 truckloads (or 360 truck trips) over a period of 30 working days. Construction traffic for this activity would likely utilize the main construction access road to/from Whipple Road.

1.2.7.8 INSTALLATION OF TRACKWORK

Installation of rail trackwork would be accomplished following the completion of the access roadway and cart paths. Trackwork construction would include the fine grading and compaction of track subgrade, installation of subballast, ballast, concrete ties, rails, and special trackwork (such as switches for rail turnouts and crossovers).

Trackwork materials would be delivered to the Project site via rail car or truck. Ballast and subballast materials would be delivered to the site by truck. Existing ballast and subgrade materials would be disposed of offsite. Approximately 5,800 cubic yards of ballast material would be needed for this work, which would generate approximately 400 truckloads (or 800 truck trips). Trackwork construction would take approximately 305 working days to complete. Approximately 85 percent of the construction traffic required for this activity (340 truckloads/680 truck trips) would likely utilize the main construction access road to/from Whipple Road, while the remaining traffic (60 truckloads/120 truck trips) would likely utilize the secondary access road to/from Gresel Street.

1.2.7.9 INSTALLATION OF GAP BREAKER STATIONS

Two Gap Breaker Stations (approximately 1,000 square feet in size) would be installed as the final stage of construction. For gap breaker station foundations, the construction method would be cast-in-place concrete. Thus, the contractor would deliver concrete and other related materials to the site via concrete and flat-bed trucks to facilitate the construction of the foundations.

Gap breaker station housings would be prefabricated structures which would be fabricated off-site and delivered to the Project site in pieces via specialized truck trailers. The housings would be assembled on site and installed over the cast-in-place foundations utilizing cranes. It is estimated that Gap Breaker Station installation work would be completed within a 2-month period. Construction traffic for this activity would likely access the site from Industrial Parkway. This phase of project construction would require approximately 2 truckloads (or four truck trips) per day over the 2-month construction period, for a total of 160 truck trips.

1.2.7.10 INSTALLATION OF TRAIN CONTROL HOUSE

A Train Control House (approximately 3,800 square feet in size) would be installed along with the Gap Breaker Stations as the final stage of construction. The train control house foundations

would consist of cast-in-place concrete. The facility would consist of masonry block walls with a metal truss roof deck system. It is estimated that Train Control House installation work would be completed within a 2-month period. Construction traffic for this activity would likely utilize the main construction access road to/from Whipple Road. This phase of project construction would require approximately 2 truckloads (or four truck trips) per day over the 2-month construction period, for a total of 160 truck trips.

1.2.7.11 BIORETENTION BASIN

A bioretention basin would be installed above the underground stormwater storage facility and between the Northern Mainline Connector tracks and the Hayward Test Track. The bioretention basin would consist of an 18-inch-thick biofiltration soil mix layer over 12 inches of drainage aggregate. Perforated plastic underdrains would be installed within the drainage aggregate layer. Approximately 3,150 cubic yards of biofiltration soil mix and drainage aggregate would be delivered to the site for this work, generating 350 truckloads (or 700 truck trips). This work would take approximately 20 days to complete. Construction traffic for this activity would likely utilize the main construction access road to/from Whipple Road.

1.2.7.12 CONSTRUCTION HOURS

Most construction activity would take place during typical workday hours 7:00 a.m. through 7:00 p.m. However, trackwork construction near the vicinity of Industrial Parkway, where rail tie-ins between the Northern Mainline Connector and the existing mainline trackwork are proposed would take place during weekends where BART would have a localized shutdown in revenue service (also known as weekend "blanket" work). The weekend blanket work would take place around the clock for two or three-day weekends to minimize disruptions to BART's revenue train service. This work would be scheduled accordingly, where BART can accommodate localized revenue service shutdowns (between South Hayward and Union City BART stations). Preparation and post construction train control testing work would be accomplished during non-revenue hours (1:30 a.m. through 4:30 a.m.).

1.2.7.13 CONSTRUCTION EMPLOYEES

Construction of the Northern Mainline Connector would require approximately 200 construction workers over the course of the Project. Although only an estimated 40 would be on site at any one time. BART and the Contractor would make arrangements for on-site of other off-street parking alternative for workers.

1.2.7.14 PROJECT COST AND FUNDING

The entire HMC2 Project would cost approximately $500 million. The Northern Mainline Connector expansion area would cost $100M. The Project would be funded through a Federal

Transit Administration Full Funding Grant Agreement. Award of the Full Funding Grant Agreement occurred in 2020.

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Chapter 2 Study Methods

2.1 Regulatory Requirements

The following federal regulatory requirements and laws apply to the proposed Project:

- NEPA (42 United States Code § 4321)
- Federal Endangered Species Act (FESA) (16 United States Code § 1531)
- Migratory Bird Treaty Act (MBTA) (16 United States Code §§ 703-712)
- Clean Water Act Sections 404 and 401

The following state regulatory requirements and laws apply to the proposed Project:

- CEQA (Public Resources Code, Division 13 § 21000 et seq.)
- California Endangered Species Act of 1984 (CESA) Fish and Game Code § 2050 et seq.
- Protection of Migratory Birds (Fish and Game Code § 3503 and 3800)
- Protection of Bats (Fish and Game Code § 2000,2002,2014 and 4150), and under California Code of Regulations § 251.1.
- California Fish and Game Code Section 1602 Streambed Alteration Agreement

2.2 Studies Required

A biological study area (BSA) was established that encompassed the Project limits and surrounding areas potentially inhabited by regional special-status species that could be affected directly or indirectly by the Project. The BSA is shown in Figure 3. A BSA is defined as the area (land and water) that may be directly, indirectly, temporarily, or permanently impacted by construction and construction-related activities.

Biological surveys and studies were performed to satisfy the requirements of CEQA, to document all special-status species that potentially occur in the BSA, and to identify all potential Project impacts on protected resources or critical habitats. Special-status species include those listed as endangered, threatened, or rare under FESA or CESA; plants listed as rare by California Native Plant Society (CNPS); migratory birds protected under the MBTA; and State Species of Special Concern (SSC).

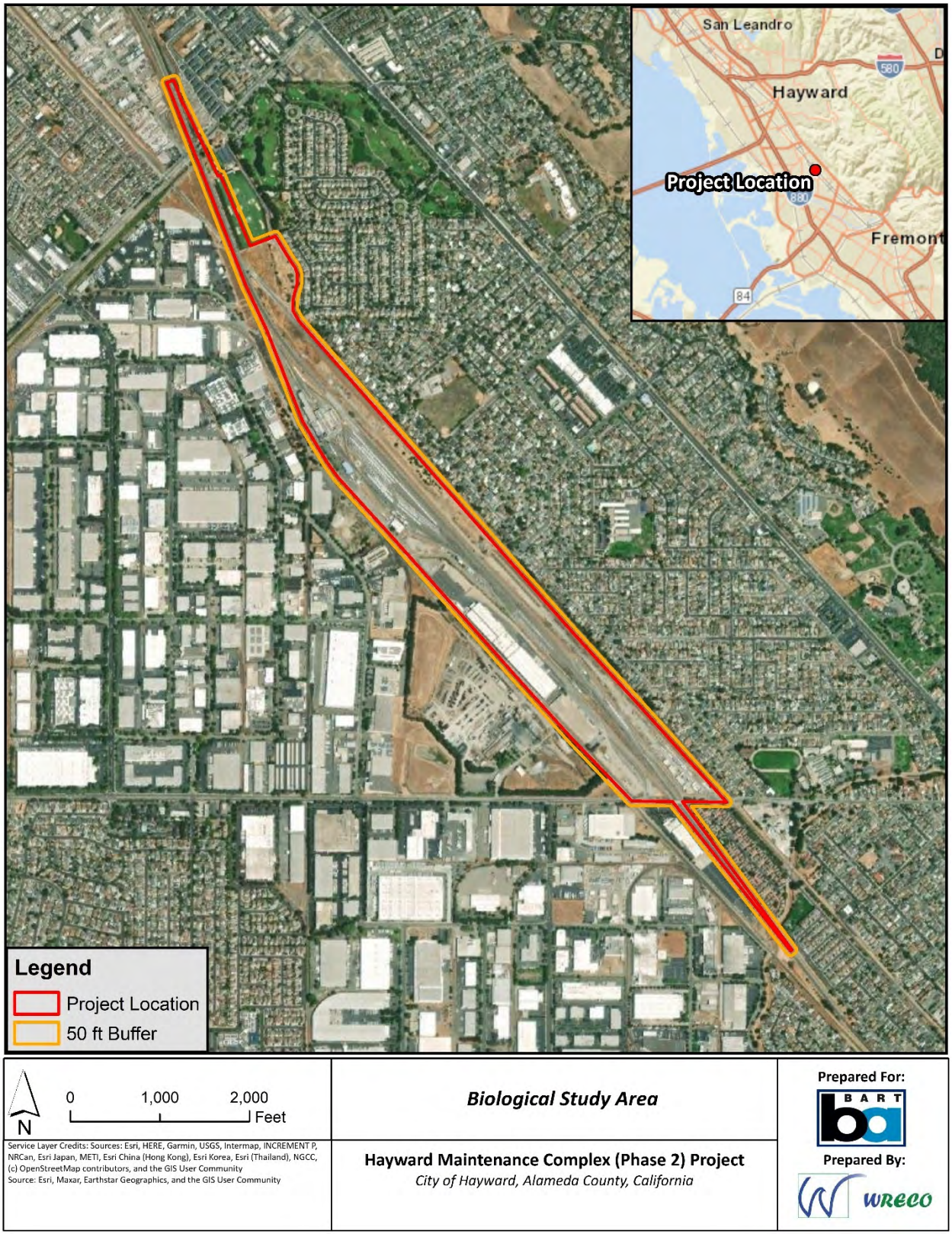

Figure 3. Biological Study Area

Source: WRECO, 2022

2.2.1 Database and Literature Searches

Information about habitat types and special-status species that can occur in the BSA was obtained from the following sources:

- U. S. Fish and Wildlife Service (USFWS) online database for federally threatened and endangered species (USFWS 2022).
- California Department of Fish and Wildlife (CDFW), California Natural Diversity Database (CDFW 2022).
- CNPS Online Inventory of Rare and Endangered Plants (CNPS 2022).

These databases were queried for all occurrence records within a 5-mile radius for the following six United States Geological Survey (USGS) quadrangles: Hayward, San Leandro, Redwood Point, Newark, Niles, and Dublin.

The USFWS database was utilized to query all federally endangered, threatened, candidate, and proposed animal and plant species as well as designated critical habitat (defined as habitats determined to be essential for the survival of that species) with known occurrences in the BSA. The aquatic features present or in the vicinity of the BSA do not provide suitable habitat for species that fall within the jurisdiction of National Oceanic and Atmospheric Administration (NOAA) Fisheries, therefore, a database list was not obtained from NOAA online resources.

Results from the USFWS and CNDDB databases were refined using available scientific literature, aerial imagery, site visits, and CNPS databases to determine which special-status species have the potential to occur in the BSA and be affected by the proposed Project. If suitable habitat was not present for a sensitive species within the BSA, the species was not given consideration beyond its inclusion on the special-status species tables.

2.2.2 Personnel and Survey Dates

Reconnaissance-level biological resources surveys were conducted to determine potential habitat for special-status species. The BSA was surveyed using the pedestrian method, by walking accessible portions of the BSA, and photo-documenting existing site conditions as well as potential habitat for special-status species. General notes were also collected, including observed plant and wildlife species. Botanical surveys were conducted at the appropriate times coinciding with the blooming period of rare species with potential to occur.

The credentials for survey personnel is:

- Scott Elder, B.A. Geography, 5 years of experience
- Gregory Wattley, B.S., Biology; M.S. Environmental Biology; 13 years of experience
- Sandra Etchell, B.A. Biology; M.S. Environmental Management; 24 years of experience

- Cuyler Stapelmann, B.S. Conservation and Resources Studies; 10 years of experience
- Kevin Fisher, B.S. Environmental health; M.S. Ecology; Professional Wetland Scientist; 21 years of experience
- Jon Cox, B.S. Biology; 1 year of experience

The dates that surveys were conducted, the types of surveys, and personnel conducting the surveys are included in Table 1.

Table 1. Survey Dates, Types, and Personnel

Date	Survey Type	Personnel
June 7, 2019	Wetland Delineation	Scott Elder
February 6, 2020	Wetland Delineation Wildlife Survey Botanical Survey	Greg Wattley, Sandra Etchell
March 10, 2020	Wetland Delineation Botanical Survey Wildlife Survey	Greg Wattley, Sandra Etchell
April 22, 2020	Wetland Delineation	Greg Wattley, Cuyler Stapelmann
May 19, 2020	Botanical Survey Tree Survey	Sandra Etchell
July 1, 2021	Wetland Delineation	Kevin Fisher, Jon Cox

2.3 Agency Coordination

The Project team produced and delivered a presentation including figures, a brief Project description, and aquatic resources found on the Project site to the San Francisco Bay RWQCB and the United States Army Corps of Engineers (USACE). Project impacts and the type of mitigation that may be required was also discussed during the presentation. On-going discussions are in progress with the RWQCB.

The USACE provided an Approved Jurisdictional Delineation (AJD) for non-wetland waters in the BSA and a Preliminary Jurisdictional Determination (PJD) for the wetlands in the BSA.

2.4 Limitations That May Influence Results

Long portion of the drainage ditches designated as waters of the State, described below in Section 4.2.1.1, are fenced and inaccessible by foot, but could be viewed from the fence line. Lack of access to these areas prevented wetlands delineations and botanical surveys from occurring in these locations.

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Chapter 3 Environmental Setting

This section describes the existing physical and biological conditions in the BSA and surrounding region. The total area of the BSA is 170.68 acres (7,434,820 sq ft.).

3.1 Physical Conditions

Generally, the BSA is located in a mixed-use area comprised of industrial, commercial, residential, and recreational uses. The surrounding area is primarily urban with the naturalistic Hayward Hills to the east.

3.1.1 Precipitation and Data Analysis

The BSA has a Mediterranean climate characterized by mild temperatures, dry summers, and wet winters (George, 2018). A climate summary report for the Project vicinity was obtained from the closest Wetlands Climate Tables (WETS) weather station which was the Hayward Air Terminal, CA.

Temperature and precipitation data for the WETS station was reviewed for the years 1971 to 2018. The maximum average temperature reported for the Hayward area was 76.3º F in September, and the lowest average temperature is 58.4º F in January. The Hayward area generally experiences precipitation between mid-October and mid-May. The average annual precipitation is 14.63 inches, with December being the wettest month, with an average of 3.04 inches, and July being the driest month, with an average of 0 inches (Natural Resources Conservation Service [NRCS], 2020).

3.1.2 Hydrology

The Project area lies within the Old Alameda Creek Watershed region which drains the Hayward Hills and a large area of the East Bay plains into the historical Old Alameda Creek. Old Alameda Creek (now known as Old Alameda Creek Flood Control Channel) is located approximately 0.24 miles southwest of the BSA.

There are no natural streams, creeks, or river crossings within the BSA; however, Dry Creek flows along the extreme southeast portion of the Project, south of Whipple Road. Dry Creek flows underneath the BART tracks through a series of box culverts. There is an engineered channel associated with the Alameda Flood Control Channel (designated by the Alameda County Flood Control as Zone 3A, Line N), which runs almost parallel to the eastern boundary of the BSA. The channel conveys flows generated from runoff from the driving range and other surrounding landscape sources. The channel is connected to Zone 3A, Line D that originates from the Hayward Hills approximately 1.2 miles east of the north portion of the BSA. Zone 3A,

Line D is diverted through underground storm drain systems as it approaches lower elevation along the State Route 238 (Mission Boulevard) corridor and residential areas between the BSA and State Route 238. Hydrology from the Project outfalls to Ward Creek which connects to Old Alameda Creek Flood Control Channel and eventually into the San Francisco Bay.

Figure 4 shows the National Wetland Inventory Map (USFWS, 2021).

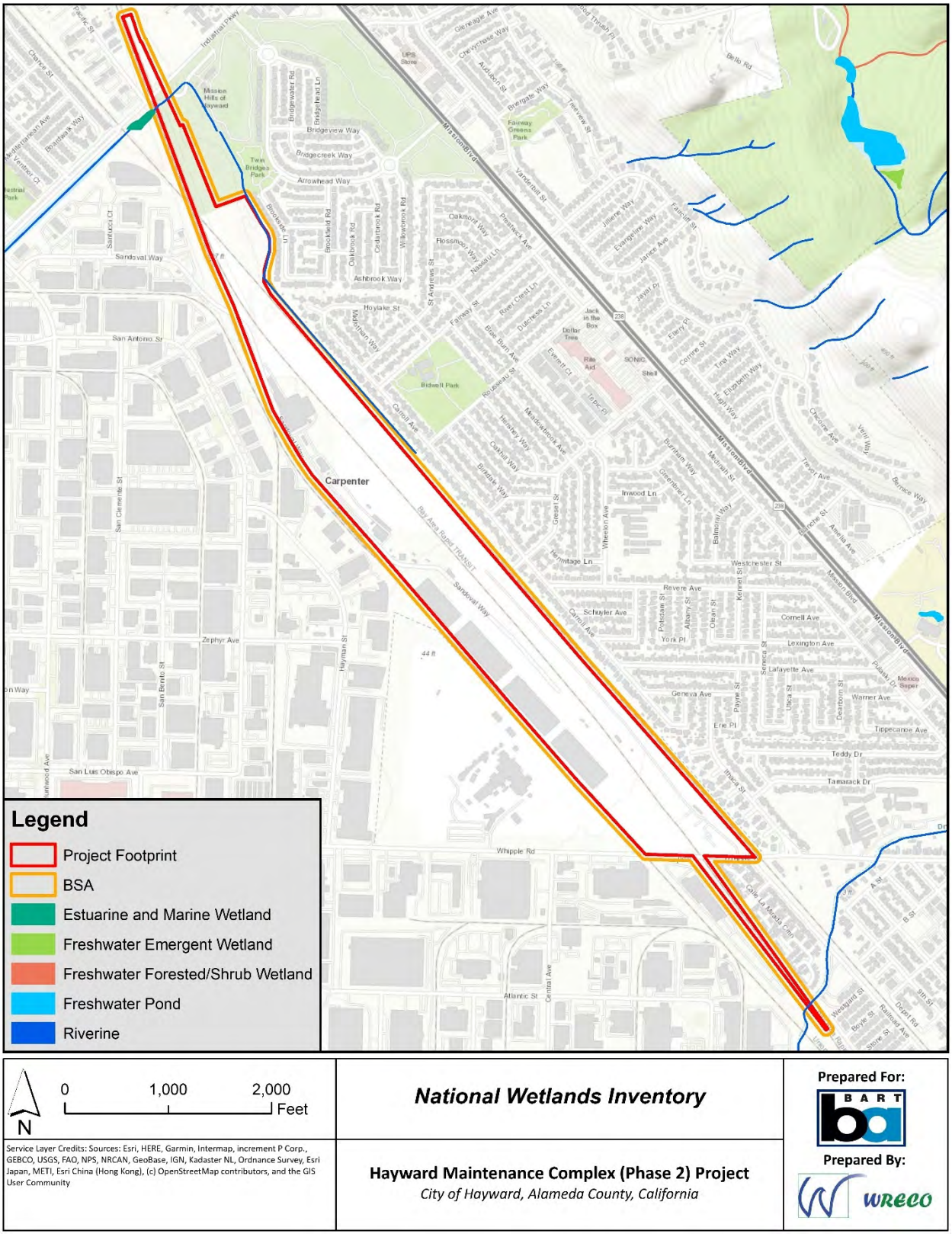

Figure 4. National Wetlands Inventory Map

Source: USFWS, 2021

3.1.3 Topography and Soils

The average elevation of the northern portion of the Project area is approximately 15 feet (ft) above mean sea level (AMSL), and the overall Project elevations range from 11 feet AMSL to 125 feet AMSL. The topography slopes gently to the west. Figure 5 shows the topography for the Project area.

Originally published by the U.S. Department of Agriculture (USDA), soil data for Alameda County was downloaded from the Soil Survey Geographic (SSURGO) database (2019), and the data was imported to ArcGIS, as shown in Figure 6. Additional soil information was obtained from the NRCS *Custom Soil Resources Report for Alameda County, California, Western Part* (USDA, 1981 and 2019). Within the BSA, soil units were identified and are summarized in Table 2.

Table 2. Soil Types

Unit Symbol	Unit Name, Slope	Drainage	Land Form	Hydric Soil
107	Clear Lake clay, drained, 0 to 2 percent slopes, Major Land Resource Area (MLRA) 14	Poorly drained	Basin floors	Yes
131	Omni silty clay loam, drained	Poorly drained	Flood plains	Yes
136	Pleasanton gravelly loam, 0 to 5 percent slopes	Well drained	Fan terraces	No
140	Rincon clay loam, 0 to 2 percent slopes, MLRA 14	Well drained	Alluvial fans, terraces	No

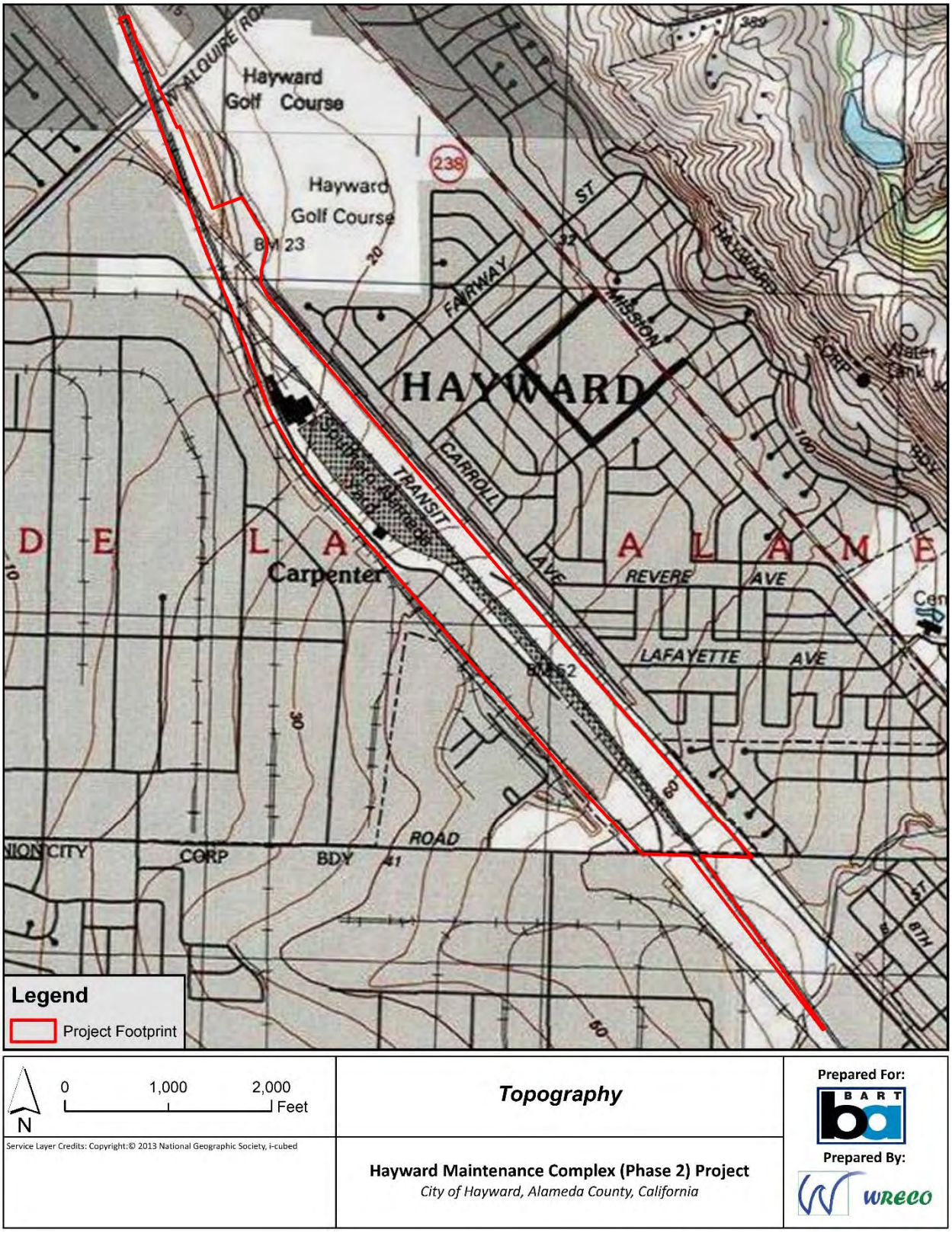

Figure 5. Topographic Map

Source: WRECO, 2022

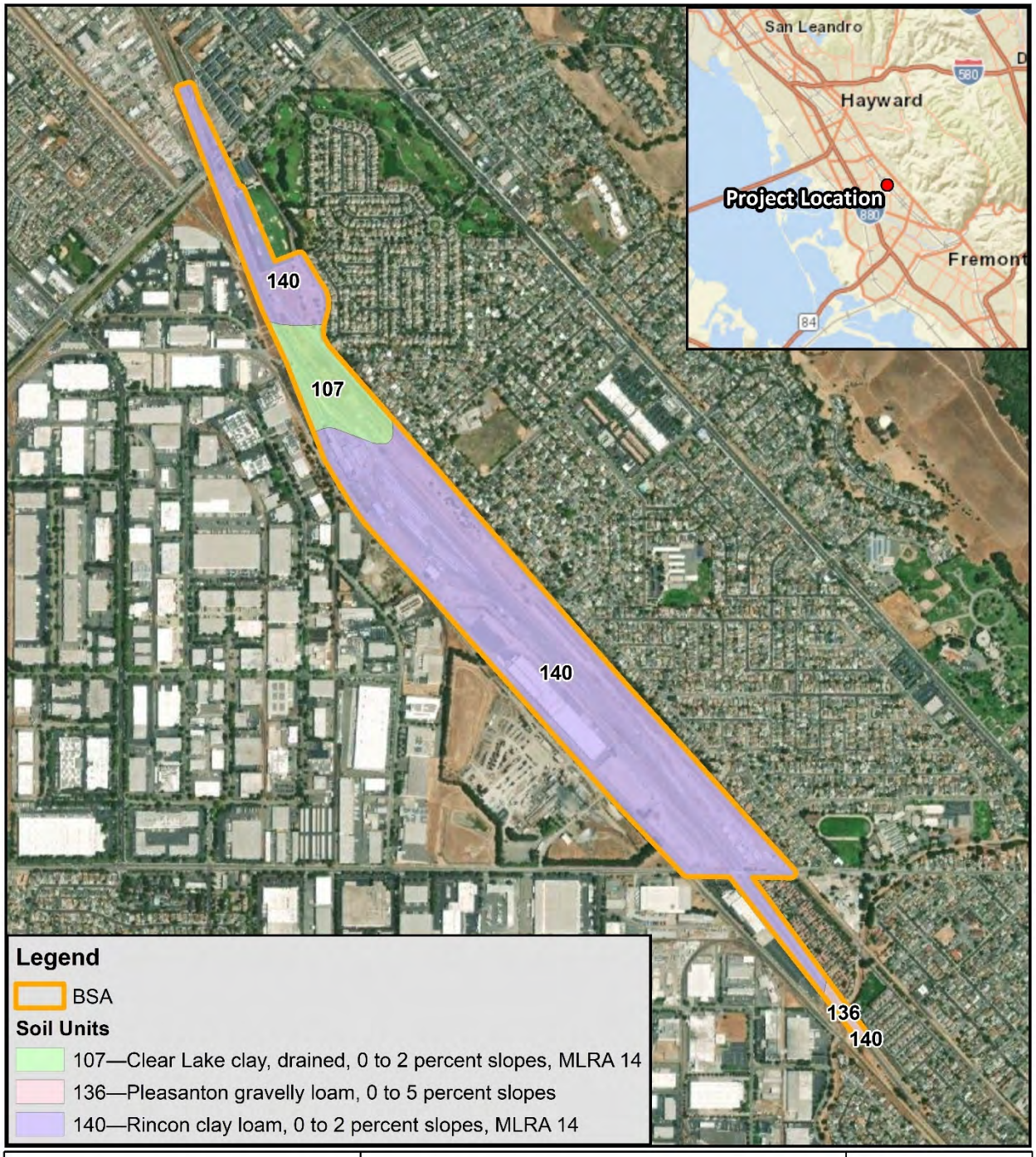

Figure 6. Soils Map

Source: USDA, 2022

3.1.4 Biological Conditions

A majority of the BSA consists of urban land uses including various buildings such as vehicle maintenance facilities serving the BART system with train storage, train washing, and general maintenance facilities for the BART fleet. There is one additional area outside of the Hayward Yard that will be used temporarily as construction staging area located immediately south of the driving range (see Figure 2).

3.1.4.1 VEGETATION COMMUNITIES

The vegetation community descriptions and nomenclature conventions within this analysis referenced the CDFW's California Wildlife Habitat Relationships System (CWHR). This classification system is based on 59 vegetative habitats described in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988). Supplemental information was obtained from *California Vegetation* (Holland and Keil, 1995).

Four vegetation communities, urban and ruderal, fresh emergent wetland, and annual grassland were present in the BSA. These communities are described below. Representative plant and wildlife species observed in the BSA are included in Appendix B.

Urban

The CWHR system classifies urban vegetation into five areas: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. Urban areas typically have a small diversity of trees, shrubs, and grasses, but greater productivity than natural grasslands due to abundant water and fertilizer (McBride and Reid, 1988). Examples include residential landscapes, golf courses, parks, and school grounds. Non-native landscape species and invasive weeds are common in urban habitats. These areas exist throughout the BSA where industrial buildings and minimal landscaped areas occur. The dominant species observed in this community include field bindweed (*Convolvulus arvensis*) and English ivy (*Hedera helix*).

Ruderal

Ruderal plant communities consist of varied, often temporary, collections of mostly non-native plants along roadsides or other disturbed areas. Shallow soils may be underlain by gravel and compacted or hard-pan surfaces, preventing many plants from establishing. Aggressive, invasive weeds such as brome grasses and thistles typically thrive in ruderal habitats (Holland and Keil, 1995). Ruderal communities occur throughout the BSA along the railroad track edges and disturbed areas. The dominant species observed in this community include soft chest brome (*Bromus hordeaceus*), wild oats (*Avena fatua*), wild radish (*Raphanus sativus*), Italian thistle (*Carduus pycnocephalus*), and prickly lettuce (*Lactuca serriola*).

Fresh Emergent Wetland

Fresh emergent wetland is a broad term for depressions on level to gently rolling land that is permanently or seasonally inundated with fresh water. This habitat is found throughout California, most commonly at elevations below 7,500 feet. Roots of fresh emergent wetland vegetation thrive in anaerobic environments; the limits of this habitat occur at the boundary of hydric and non-hydric soils. The composition of the plant community depends on the depth and flow rate of the water, but cattail, bulrush, and redroot nutgrass are characteristic. Fresh emergent wetland provides some of the most productive wildlife habitat in the state (Kramer, 1988). The dominant species observed in this habitat type include bird's foot trefoil (*Lotus corniculatus*), tall flatsedge (*Cyperus eragrostis*), and bristly ox-tongue (*Helminthotheca echioides).*

Annual Grassland

Non-native or naturalized annual grasses and forbs have largely replaced pre-colonial grasslands on rolling hills and flat plains in California. Although a rich variety of native species may be present, grasses such as wild oats and barley, brome species, and soft chess, dominate this habitat (Kie, 2005). The species composition varies widely depending on weather and grazing patterns, but the habitat generally has a water deficit for four to eight months annually (Barbour et al., 2007). Grasses germinate in the fall but do not grow vigorously until temperatures increase. By the summer, fields typically contain a large amount of dead plant material. In the BSA, annual grassland occurred between the fresh emergent wetland and soil stockpiles, between the UPRR and Hayward Yard service tracks. The dominant species include ripgut brome (*Bromus diandrus*) and wild oat (*Avena fatua*).

3.1.4.2 HABITAT CONNECTIVITY

The BSA does not provide habitat connectivity for wildlife due to its the surrounding vast network of city streets, State Route 238, and the BART and UPRR corridors that traverse the site. Wildlife that dwell in urban environments, such as raccoons, skunks, and opossums, typically establish small territories that they seldom venture from.

3.2 Regional Species and Habitats of Concern

Database lists from online sources included in the discussion below are included in Appendix C.

3.2.1 Sensitive Natural Communities

Sensitive natural communities are recurring associations of plants and animals found in particular locations with specific physical conditions. Natural Communities of Special Concern are plants, animals, and natural resources that may have high species diversity, high productivity, limited distribution, decreasing range, or unusual characteristics. Natural Communities of Special Concern as designated by CDFW, may include wetlands and "Waters of the U.S.,"

"Waters of the State," protected trees, riparian habitats, and federally designated essential fish habitats.

A CNDDB online database search resulted in a total of two sensitive natural community that occur within the six USGS quadrangles within a 5-mile radius of the BSA. The natural communities listed and their proximity to the BSA is included in Table 3.

Table 3. Natural Communities of Special Concern in the BSA

Sensitive Natural Community	Present in BSAs	Proximity to BSA
Northern Coast Salt Marsh	No	There are no CNDDB occurrence for Northern Coast Salt Marsh communities within a 5-mile radius of the BSA.
Valley Needlegrass Grassland	No	There are no CNDDB occurrence for Valley Needlegrass Grassland communities within a 5-mile radius of the BSA.

3.2.2 Special-Status Plant Species

A list of sensitive plant species and habitats potentially occurring within the Project vicinity was developed based on information compiled from CNDDB, USFWS, CNPS, species distribution, and habitat data. Combined, the CNDDB, CNPS, and USFWS databases list a total of 38 special-status plants (including federally listed, state-listed, and/or CNPS List 1B or 2) that could occur within a 5-mile radius of the BSA. The results from all database queries and a map of CNDDB plant occurrences are presented in Appendix C. Table 4 lists the special-status plants generated from these databases and provides explanations for the potential presence or absence of these plants. The table provides the names and listed status of each species, descriptions of their preferred habitats, and their likelihood of occurrence in the BSA.

3.2.3 Special-Status Wildlife Species

A total of 40 special-status wildlife species and protected habitats have the potential to occur within the BSA, as indicated by the CNDDB and USFWS online databases. Table 5 lists the special-status wildlife generated from the database searches and provides descriptions for the potential presence or absence of the wildlife, listed status, required habitats, and their likelihood of occurrence in the BSA. Based on evaluation, it was determined that special-status wildlife species that could occur in the BSA include burrowing owl, pallid bat, white-tailed kite, roosting bats, migratory bird species.

The results from all database queries and a map of CNDDB plant occurrences are presented in Appendix C.

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Table 4. Special-Status Plant Species with Potential to Occur in the Biological Study Area (BSA)

Scientific Name **Common Name**	***Status***			**Blooming Period**	**Habitat Requirements (bold if present in BSA)**	**Potential to Occur/ Rationale**
	Fed	**State**	**CNPS**			
Amsinckia lunaris Bent-flowered fiddleneck	--	--	1B.2	Mar-Jun	Coastal bluff scrub, cismontane woodland, **valley and foothill grassland**. Elev. 10-1640 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Astragalus tener var. *tener* Alkali milk-vetch	--	--	1B.2	Mar-Jun	**Valley and foothill grassland** in adobe clay soil; playas and vernal pools with alkaline soil. Elev. 0-200 ft.	**None.** While valley and foothill grassland is present, suitable soil conditions are absent from the BSA.
Balsamorhiza macrolepis Big-scale balsamroot	--	--	1B.2	Mar-Jun	Chaparral, cismontane woodland, **valley and foothill grassland** sometimes in serpentinite soil. Elev. 295-5100 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Calochortus umbellatus Oakland star-tulip	--	--	4.2	Mar-May	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, **valley and foothill grassland** often in serpentinite soil. Elev. 325-2300 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Campanula exigua	--	--	1B.2	May-Jun	Chaparral in rocky, usually serpentinite soil. Elev. 900-4100 ft.	**None.** No chaparral habitat is present in the BSA.

Scientific Name Common Name	*Status*			Blooming Period	Habitat Requirements (bold if present in BSA)	Potential to Occur/ Rationale
	Fed	State	CNPS			
Chaparral harebell						
Castilleja ambigua var. ambigua johnny-nip	--	--	4.2	Mar-Aug	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, **valley and foothill grassland**, vernal pools margins. Elev. 0-1430 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Centromadia parryi ssp. *congdonii* Congdon's tarplant	--	--	1B.1	May-Nov	**Valley foothill grassland** in alkaline soil. Elev. 0-755 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Chloropyron maritimum ssp. *palustre* Point Reyes salty bird's-beak	--	--	1B.2	Jun-Oct	Coastal salt marshes and swamps. Elev. 0-35 ft.	**None.** No marshes or swamps are present in the BSA.
Chorizanthe robusta var. robusta Robust spineflower	FE	--	1B.1	Apr-Sep	Maritime chaparral, openings in cismontane woodland, coastal dunes, coastal scrub in sandy or gravelly soil. Elev. 10-985 ft.	**None.** No chaparral, woodland, dune or scrub habitat is present in the BSA.

Scientific Name **Common Name**	***Status***			**Blooming Period**	**Habitat Requirements (bold if present in BSA)**	**Potential to Occur/ Rationale**
	Fed	**State**	**CNPS**			
Clarkia concinna ssp. *automixa* Santa Clara red ribbons	--	--	4.3	Apr-Jun	Chaparral, cismontane woodland. Elev. 295-4920 ft.	**None.** No chaparral or woodland habitat is present in the BSA.
Dirca occidentalis Western leatherwood	--	--	1B.2	Jan-Apr	Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland in mesic areas. Elev. 80-1395 ft.	**None.** No forest, chaparral, or woodland habitat is present in the BSA.
Eryngium aristulatum var. *hooveri* Hoover's button-celery	--	--	1B.1	Jun-Aug	Vernal pools and **wetlands**. Elev. 0-165 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Eryngium jepsonii Jepson's coyote thistle	--	--	1B.2	Apr-Aug	**Valley and foothill grassland**, vernal pools in clay soil. Elev. 10-985 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.

Scientific Name Common Name	*Status*			Blooming Period	Habitat Requirements (bold if present in BSA)	Potential to Occur/ Rationale
	Fed	State	CNPS			
Extriplex joaquinana San Joaquin spearscale	--	--	1B.2	Apr-Oct	Chenopod scrub, meadows and seeps, playas, and **valley and foothill grassland** in alkaline soil. Elev. 0-2740 ft.	**None.** While valley and foothill grassland is present, suitable soil conditions are absent from the BSA.
Fritillaria liliacea Fragrant fritillary	--	--	1B.2	Feb-Apr	Cismontane woodland, coastal prairie, coastal scrub, **valley and foothill grassland** often in serpentinite soil. Elev. 10-1345 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Gilia millefoliata Dark-eyed gilia	--	--	1B.2	Apr-Jul	Coastal dunes. Elev. 5-100 ft.	**None.** No coastal dunes are present in the BSA.
Helianthella castanea Diablo helianthella	--	--	1B.2	Mar-Jun	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and **valley and foothill grassland**. Usually in rocky axonal soil, often in partial shade. Elev. 195-4265 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Hoita strobilina Loma Prieta hoita	--	--	1B.1	May-Oct	Chaparral, cismontane woodland, riparian woodland, usually mesic areas and serpentinite soil. Elev. 95-2825 ft.	**None.** No chaparral or woodland habitat is present in the BSA.

Scientific Name **Common Name**	***Status***			**Blooming Period**	**Habitat Requirements (bold if present in BSA)**	**Potential to Occur/ Rationale**
	Fed	**State**	**CNPS**			
Holocarpha macradenia Santa Cruz tarplant	FT	SE	1B.1	Jun-Oct	Coastal prairie, coastal scrub, **valley and foothill grassland**. Elev. 30-725 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Horkelia cuneata var. *sericea* Kellogg's horkelia	--	--	1B.1	Apr-Sep	Openings in closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub in sandy or gravelly soil. Elev. 30-660 ft.	**None.** No forest, chaparral, dunes or scrub habitat is present in the BSA.
Lasthenia conjugens Contra Costa goldfields	FE	--	1B.1	Mar-Jun	Cismontane woodland, playas in alkaline soil, mesic valley and foothill grassland, vernal pools in mesic areas. Elev. 0-1545 ft.	**None.** No woodland habitat or mesic conditions are present in the BSA.
Leptosiphon acicularis Bristly leptosiphon	--	--	4.2	Apr-Jul	Chaparral, cismontane woodland, coastal prairie, and **valley and foothill grassland**. Elev. 0-700	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Monardella antonina ssp. Antonina	--	--	4.3	Jun-Aug	Chaparral and wooded slopes. Elev. 22-7057	**None.** This species was not observed during botanical surveys.

Scientific Name Common Name	*Status*			Blooming Period	Habitat Requirements (bold if present in BSA)	Potential to Occur/ Rationale
	Fed	State	CNPS			
San Antonio Hills monardella						
Monolopia gracilens Woodland woolythreads	--	--	1B.2	Feb-Jul	Broadleafed upland forest (openings), chaparral (openings), cismontane woodland, north coast coniferous forest (openings), **valley and foothill grassland** in serpentine soil. Elev. 325-3940 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Navarretia myersii ssp. myersii Pincushion navarretia	--	--	1B.1	Apr-May	Vernal pools and **wetland**. Elev. 145-330 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Navarretia paradoxiclara Patterson's navarretia	--	--	1B.3	May-Jun(Jul)	Serpentinite, openings, vernally mesic, often drainages. Meadows and seeps Elev. 490-1410 ft.	**None.** This species was not observed during botanical surveys.
Piperia michaelii Michael's rein orchid	--	--	4.2	Apr-Aug	Coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest. Elev. 10-3005 ft.	**None.** This species was not observed during botanical surveys.

Scientific Name **Common Name**	***Status***			**Blooming Period**	**Habitat Requirements (bold if present in BSA)**	**Potential to Occur/ Rationale**
	Fed	**State**	**CNPS**			
Plagiobothrys glaber Hairless popcornflower	--	--	1A	Mar-May	Meadows and seeps with alkaline soil, coastal salt marshes and swamps. Elev. 15-410 ft.	**None.** This species was not observed during botanical surveys.
Polemonium carneum Oregon polemonium	--	--	2B.2	Apr-Sep	Coastal prairie, coastal scrub, lower montane coniferous forest. Elev. 0-6005 ft.	**None.** This species was not observed during botanical surveys.
Polygonum marinense Marin knotweed	--	--	3.1	Apr-Oct	Coastal salt or brackish marshes and swamps. Elev. 0-35 ft.	**None.** This species was not observed during botanical surveys.
Ranunculus lobbii Lobb's aquatic buttercup	--	--	4.2	Feb-May	Cismontane woodland, **valley and foothill grassland**, vernal pools, north coast coniferous forest. Elev. 50-1545 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Sanicula maritima Adobe sanicle	--	SR	1B.1	Feb-May	Chaparral, coastal prairie Meadows and seeps, **valley and foothill grassland** in clay or serpentinite soil. Elev. 95-790 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.

Scientific Name Common Name	*Status*			Blooming Period	Habitat Requirements (bold if present in BSA)	Potential to Occur/ Rationale
	Fed	State	CNPS			
Senecio aphanactis Chaparral ragwort	--	--	2B.2	Jan-May	Chaparral, cismontane woodland, coastal scrub, sometimes in alkaline soil. Elev. 45-2625 ft.	**None.** This species was not observed during botanical surveys.
Spergularia macrotheca var. *longistyla* Long-styled sand-spurry	--	--	1B.2	Feb-May	Meadows and seeps, marshes and swamps in alkaline soils. Elev. 0-840 ft.	**None.** This species was not observed during botanical surveys.
Streptanthus albidus ssp. *peramoenus* Most beautiful jewelflower	--	--	1B.2	Mar-Oct	Chaparral, cismontane woodland, **valley and foothill grassland** in serpentinite soil. Elev. 310-3280 ft.	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly disturbed soils and conditions at the site.
Stuckenia filiformis ssp. *alpina* Slender-leaved pondweed	--	--	2B.2	May-Jul	Assorted shallow freshwater marshes and swamps. Elev. 980-7055 ft.	**None.** This species was not observed during botanical surveys.
Suaeda californica California seablite	FE	--	1B.1	Jul-Oct	Coastal salt marshes and swamps. Elev. 0-50 ft.	**None.** This species was not observed during botanical surveys.
Trifolium hydrophilum Saline clover	--	--	1B.2	Apr-Jun	Marshes and swamps, **valley and foothill grassland** in mesic areas with	**None.** This species was not observed during botanical surveys and is not expected to occur due to the highly

Scientific Name Common Name	*Status*			Blooming Period	Habitat Requirements (bold if present in BSA)	Potential to Occur/ Rationale
	Fed	State	CNPS			
					alkaline soil, vernal pools. Elev. 0-985 ft.	disturbed soils and conditions at the site.

Notes:

General Habitat Descriptions are based upon definitions utilized by the CNPS online Inventory of Rare and Endangered Plants (2020). Habitats present within the study area are emphasized with bold print.

BSA = Biological Study Area
CNPS = California Native Plant Society

Status Legend
-- = No status, or not applicable
FE = Listed as endangered under the Federal Endangered Species Act (FESA)
FT = Listed as threatened under FESA
SE = Listed as endangered under the California Endangered Species Act (CESA)
SR = Listed as rare under CESA
ST = Listed as threatened under CESA
CE = Listed as candidate endangered CESA

CNPS Ranking
1A = Presumed extinct in California and either rare or extinct elsewhere.
1B = Rare, threatened, or endangered in California and elsewhere.
2A = Presumed extinct in California but common elsewhere.
2B = Rare, threatened, or endangered in California but more common elsewhere.

Threat Ranks
0.1 = Seriously threatened in California (more than 80% of occurrences threatened/high degree and immediacy of threat).
0.2 = Moderately threatened in California (20-80% occurrences threatened/moderate degree and immediacy of threat).

Potential to Occur Definitions

None = No possibility for occurrence.

Low = Suitable habitat present; not likely to occur due to environmental constraints, but cannot be ruled as absent.

Moderate = Potential to occur based on habitat suitability and documented records in the study area region.

High = Species has been document within the study area.

Table 5. Special-Status Wildlife Species with Potential to Occur in BSA or Vicinity

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
Invertebrates				
Lepidurus packardi Vernal pool tadpole shrimp	FE	--	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass-bottomed swales of unplowed grasslands.	**None.** There are no vernal pools or swales within or near the BSA.
Branchinecta lynchi Vernal pool fairy shrimp	FT	--	Endemic to the grasslands of the Central Valley, Central Coast, and South Coast mountains, in astatic rain-filled pools. Inhabits small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	**None.** There are no clear water depressions or pools within or near the BSA.
Callophrys mossii bayensis San Bruno elfin butterfly	FE	--	Found in coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes. Larval host plant is *Sedum spathulifolium*.	**None.** The BSA is outside of the range of this species.
Danaus plexippus pop. 1 Monarch - California overwintering population	Candidate	--	Winter roost sites in closed-cone coniferous forests along the coast from northern Mendocino to Baja California, Mexico. Roosts are located in wind-protected tree groves	**None.** There are no forest habitats in the BSA.

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
			(eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	
Fish				
Oncorhynchus mykiss irideus pop. 8 Steelhead – central California coast DPS	FT	--	From Russian River, south to Soquel Creek and to, but not including, Pajaro River. Also San Francisco and San Pablo Bay basins.	**None.** There is no suitable aquatic habitat present in the BSA.
Hypomesus transpacificus Delta smelt	FT	SE	Inhabits Sacramento-San Joaquin Delta, seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay. Seldom found at salinities greater than 10 ppt. Most often at salinities less than 2 ppt.	**None.** There is no suitable aquatic habitat present in the BSA.
Spirinchus thaleichthys Longfin smelt	Candidate	ST, SSC	Found in open waters of estuaries, mostly in middle or bottom of water column. During summer, found in mid- to low-water column in deep cool water in the central San Francisco Bay. During fall, migrates into low salinity or freshwater reaches of coastal rivers and tributary streams to spawn. Prefer salinities of 15-30 parts per thousand but can be found in completely freshwater to almost pure seawater.	**None.** There is no suitable aquatic habitat present in the BSA.

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
Amphibians				
Ambystoma californiense California tiger salamander	FE/FT	ST	Central Valley DPS federally listed as threatened. Santa Barbara County and Sonoma County DPS federally listed as endangered. Needs underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	**None.** There are no vernal pools or seasonal water features suitable for breeding within or near the BSA.
Rana draytonii California red-legged frog	FT	SSC	Found in lowlands and foothills in or near-permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Needs access to rodent burrows, cracks, and crevices in the ground for refugia. Water salinity must be less than 7 ppt for adults and larvae[4].	**None.** The nearest CNDDB occurrence (34) is for a frog found in a pond in Garin Regional Park in the hills 1.9 miles east of the BSA and frogs would have to cross barriers including I-680, and commercial and residential areas to travel over land to the site. The pond has connectivity to the Dry Creek Watershed which does not have connectivity to the drainage in the BSA. An engineered channel associated with Ward Creek runs roughly parallel to the eastern boundary of the BSA. The channel conducts shallow flows generated from runoff from the golf course and other landscape sources. Frogs would

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
				not be likely to pass through culvert systems or unvegetated open channels to get to the BSA since there are no aquatic resources south of the BSA.
Rana boylii Foothill yellow-legged frog	--	SE	Inhabits partly-shaded, shallow freshwater streams and riffles with a rocky substrate in a variety of habitats. Needs cobble-sized substrate for egg-laying and at least 15 weeks of water to attain metamorphosis.	**None.** There is no suitable breeding habitat nor are there CNDDB records for this species within a five-mile radius of the BSA.
Emys marmorata Western pond turtle	--	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation, below 6000 feet elevation. Needs basking sites and sandy banks or grassy open fields for egg-laying.	**None.** There are no CNDDB records for this species within a five-mile radius of the BSA. Pond turtles would have difficulty entering the BSA since there is are no unculverted or open drainages with access to the site.
Masticophis lateralis euryxanthus Alameda whipsnake	FT	ST	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna, and woodland habitats. Mostly in south-facing slopes and ravines, with rock outcrops, deep crevices, or abundant rodent burrows, where shrubs form a vegetative mosaic with oak trees and grasses.	**None.** There are 15 CNDDB records for this species within a five-mile radius of the BSA. The nearest record (137) is for a snake found 1.2 miles north near CSU Hayward in 1991. The remaining 14 occurrences are for snakes found at various locations in the Hayward Hill east of the BSA including Garin Park (EBRPD) and on private land on Walpert Ridge. Although there are relatively nearby records for this species, there are none west of State Route 238. It would be difficult for

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
				whipsnakes to traverse SR 238, the residential areas, the UPRR tracks to safely enter the BSA.
Birds				
Coturnicops noveboracensis Yellow rail	--	SSC	For breeding it prefers freshwater grass or sedge marshes and wet meadows, but also may use brackish wetlands, particularly the drier margins, that are dominated by *Carex*. Summer resident in eastern Sierra Nevada in Mono County.	**None.** The BSA is outside of the breeding range for this species.
Laterallus jamaicensis coturniculus California black rail	--	ST	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	**None.** There are no marshes or wet meadows within or near the BSA.
Rallus obsoletus obsoletus Ridgway's rail	FE	SE, FP	Found in salt and brackish marshes traversed by a network of well-developed tidal sloughs in the vicinity of San Francisco Bay.	**None.** There are no marshes or tidal sloughs within or near the BSA.
Charadrius nivosus nivosus Western snowy plover	FT	SSC	Needs sandy, gravelly or friable soils for nesting. Nesting sites include sand spits, dune-backed beaches, beaches at creek and river	**None.** There are no sandy spits, dunes, beaches, lagoons or estuaries, within or near the BSA.

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
			mouths, and salt pans at lagoons and estuaries. Less common nesting habitats include bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars.	
Sternula antillarum browni California least tern	FE	SE, FP	Nests along the coast from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas.	**None.** The BSA is not along the shoreline where this species prefers to nest.
Rynchops niger Black skimmer	--	SSC	Nests on gravel bars, low islets, and sandy beaches in unvegetated sites. Nesting colonies usually have fewer than 200 pairs.	**None.** The BSA is not along the shoreline where this species prefers to nest.
Elanus leucurus White-tailed kite	--	FP	Found in rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Forages in open grasslands, meadows, or marshes close to isolated, dense-topped trees for nesting and perching.	**High.** A pair of kites were observed nesting in 2020 in a tall tree in the back yard of a residence immediately east of the BSA.
Circus hudsonius Northern harrier	--	SSC	Found in coastal salt and freshwater marsh. Nests and forages in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh	**None.** There is no suitable marsh nesting habitat within or near the BSA.

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
			edge; nests built of a large mound of sticks in wet areas.	
Aquila chrysaetos Golden eagle	--	FP	Found in rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	**None.** This species could nest in the Hayward Hills east of the BSA but there is no nesting suitable habitat in or near the BSA.
Athene cunicularia Burrowing owl	--	SSC	Occurs in open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	**Low.** Though there are no CNDDB records for this species within a five-mile radius of the BSA, the grasslands provide suitable habitat. No suitably sized burrows were present during biological surveys however this species should be included in preconstruction nesting bird surveys.
Asio flammeus Short-eared owl	--	SSC	Found in swamp lands, both fresh and salt; lowland meadows; and irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	**None.** There are no swamplands, meadows, or similar aquatic features nearby that provide suitable nesting habitat for this species.
Riparia riparia Bank swallow	--	ST	Colonial nester, primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	**None.** There are no riparian or aquatic habitats with vertical banks or cliffs in or near the BSA.

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
Geothlypis trichas sinuosa San Francisco (saltmarsh) common yellowthroat	--	SSC	Resides in fresh and saltwater marshes and creeks of the San Francisco Bay region. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	**None.** The BSA is outside of the nesting range of this species.
Melospiza melodia pusillula Alameda song sparrow	--	SSC	Inhabits salt marshes bordering south arm of San Francisco Bay. Found in *Salicornia* marshes; nests low in *Grindelia* bushes (high enough to escape high tides) and in *Salicornia*.	**None.** The BSA is outside of the nesting range of this species.
Scetophaga petechia Yellow warbler	--	SSC	Nests and forages in thickets of riparian vegetation consisting of willows, cottonwood, sycamores, ash, or alders.	**None.** There are no riparian thickets present in the BSA.
Agelaius tricolor Tricolored blackbird	--	SSC, Candidate	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey near the colony.	**None.** There is no open water habitat or other suitable nesting habitat for this species within or near the BSA.
Mammals				
Sorex vagrans halicoetes Salt-marsh wandering shrew	--	SSC	Confined to small remnant stands of salt marsh found around the southern arm of the San Francisco Bay. Found in medium-high marsh, 6	**None.** There is no salt marsh habitat within or near the BSA.

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
			to 8 feet above sea level, where abundant driftwood is scattered among *Salicornia*.	
Myotis yumanensis Yuma myotis	--	F.G.C.§2124,§2126	Forages for insects in open forests and woodlands with nearby water bodies. Forms maternity colonies in caves, mines, buildings, and crevices.	**Low.** There is a low potential for bats to roost in the existing overpass crossing Industrial Parkway.
Lasiurus cinereus Hoary bat	--	F.G.C.§2124, §2126	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Requires water.	**Low.** There are numerous trees within the BSA along the UPRR tracks that will be removed. Preconstruction surveys are recommended for roosting bats.
Corynorhinus townsendii Townsend's big-eared bat	--	SSC	Roosts in man-made structures such as old buildings and bridge crevices.	**None.** This species is known to be especially sensitive to human activity and noise. BART Trains crossing Industrial Parkway on the overpass produce too much noise for Townsend's big-eared bat to roost.
Antrozous pallidus Pallid bat	--	SSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting.	**Low.** There is a low potential for bats to roost in the existing overpass crossing Industrial Parkway.
Eumops perotis californicus Western Mastiff bat	--	SSC	Found in a variety of habitats including chaparral, cismontane woodland, coastal scrub, and valley and foothill grasslands. Roosts in	**Low.** There is a low potential for bats to roost in the existing overpass crossing Industrial Parkway.

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
			crevices in cliff faces, high buildings, and tunnels.	
Vulpes macrotis mutica San Joaquin kit fox	FE	ST	Found in annual grasslands or grassy open stages with scattered shrubby vegetation. Needs loose-textured sandy soils for burrowing, and suitable prey base.	**None.** The BSA is outside of the range for this species.
Reithrodontomys raviventris Salt-marsh harvest mouse	FE	SE, FP	Primary habitat is pickleweed in the saline emergent wetlands of San Francisco Bay and its tributaries. Suitability of saltmarsh habitat is limited by small size, fragmentation, and lack refugial habitat[5].	**None.** There are no saline emergent wetlands within or near the BSA.
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	--	SSC	Occurs in forest habitats of moderate canopy and moderate-to-dense understory. May prefer chaparral and redwood habitats. Constructs nests of shredded grass, leaves, and other material.	**None.** There are no suitable thickets for nesting for this species within the BSA. No nests were observed during biological resource surveys.
Scapanus latimanus parvus Alameda Island mole		SSC	Only known from Alameda Island. Found in a variety of habitats, especially annual and	**None.** The BSA is outside of the range for this species.

Scientific Name **Common Name**	**Status** **Federal/State**		**Habitat Description**	**Potential to Occur in Project Area**
			perennial grasslands. Prefers moist, friable soils.	
Taxidea taxus American badger	--	SSC	Most abundant in drier, open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	**None.** No dens for this species were observed during 2019 and 2020 biological resources surveys.

Notes:

- In this report, evaluation of potential presence is based upon the types of habitat that each listed species occupies and on observations made during site surveys.
- General Habitat Description taken from the California Natural Diversity Database (CDFW 2020) unless otherwise noted.
- Bats are protected under nongame mammal provisions in the California Fish and Game Code.

Status Legend

FE = Listed as endangered under the Federal Endangered Species Act (FESA)

FT = Listed as threatened under FESA

SE = Listed as endangered under the California Endangered Species Act (CESA)

ST = Listed as threatened under CESA

SSC = Species of special concern under CESA

FP = Fully Protected under CESA Fish and Game Code §2124 and 2126

Candidate = Candidate under consideration for threatened or endangered status

Rationale Definitions

None = No possibility for occurrence.

Low = Suitable habitat present; not likely to occur due to environmental constraints, but cannot be ruled as absent.

Moderate = Potential to occur based on habitat suitability and documented records in the BSA region.

High = Species has been documented within the BSA.

Chapter 4 Results: Biological Resources, Discussion of Impacts, and Mitigation

Project biologists conducted site surveys on June 7, 2019; and on February 6, March 10, April 22, May 19, 2020; and July 1, 2021. Various databases searches, and resource evaluations to determine the presence of special-status species, and their likelihood of occurrence within the BSA. Biological evaluations were also performed to determine whether critical habitats were present or had the potential to occur in the BSA. This chapter discusses these issues. Representative photos from the site visits are included in Appendix D.

4.1 Natural Communities of Special Concern

As described in Section 3.2.1, Natural Communities of Special Concern are recurring associations of plants and animals found in particular locations with specific physical conditions. These communities may have high species diversity, high productivity, limited distribution, decreasing range, or unusual characteristics. The following section identifies potential impacts on natural communities of special concern within the BSA.

4.1.1 Survey Results

As shown in Table 3 above, two natural communities of special concern (Northern coast salt marsh and valley needlegrass grassland) were listed in the six quadrant CNDDB search. However, neither of these natural communities have records of occurring within 5 miles of the BSA. Therefore, there will be no impacts to these communities, so no impacts discussion or AMMs are included.

4.2 Potential Wetlands and Other Waters of the U.S. and Waters of the State

This section provides discussion of potential wetlands and "Other Waters of the U.S." that would be subject to USACE jurisdiction under Section 404 of the Clean Water Act (CWA).

4.2.1 Wetlands and Other Waters of the U.S. and Waters of the State

According to the USACE (Federal Register 1986) wetlands are transitional areas (i.e., inundated for a long enough period of time to support vegetation adapted for life in saturated conditions) between aquatic resources and upland areas. These include swamps, marshes, bogs, and fens. Under 33 Code of Federal Regulations (CFR) Part 328.3(a) and 40 (CFR) part 230.3(s), Waters of the U.S. are defined as:

> All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

The USACE has primary federal responsibility for administering regulations that concern waters and wetlands. The USACE acts under two statutory authorities. Wetlands and other water resources (e.g., rivers, streams, and natural basins) are a subset of Waters of the U.S. and receive protection under Section 404 of the federal CWA. Additionally, the Rivers and Harbors Act (Sections 9 and 10) govern specified activities in Waters of the U.S. including wetlands.

The California Water Code defines Waters of the State as "any surface water or groundwater, including saline waters, within the boundaries of the State" (Water Code Section 13050[e]). Waters of the State include all Waters of the U.S. as well as isolated wetlands, disjunct streams, and stream areas above the Ordinary High Water Mark either to the top of bank or farthest extent of riparian vegetation. The RWQCB and CDFW may exercise jurisdiction over impacts to Waters of the State and the RWQCB may also regulate discharges into the Waters of the State.

4.2.1.1 SURVEY RESULTS

Three wetlands were delineated within the BSA and were determined to be potentially jurisdictional under Section 404 and 401 of the CWA and thus subject to regulation under the USACE and RWQCB. These wetlands, designated as Potential Wetland (PW) 1, PW 2, and PW 3 (Figure 7), satisfy the three-parameter definition of a wetland as defined by the USACE. The combined area of these wetlands is 0.652 acres (ac) (28,401 square feet [sq. ft]). Refer to Appendix E for maps of delineated aquatic resources within the BSA.

A drainage feature towards the north end of the BSA adjacent to Industrial Parkway was determined to be potentially jurisdictional under Section 404 and 401 of the CWA. This feature was delineated on July 1, 2021 and still had flow despite drought conditions.

Another drainage feature runs through the center of the HMC yard for considerable length. This drainage feature was designated as waters of the State (WS) 1 (Figure 8) and is segmented by three culverts along its length. This ditch was determined to be non-jurisdictional by USACE (see Aquatic Resources Delineation attachments in Appendix E).

The final delineated feature is another drainage designated as WS 2 (Figure 8). This drainage is shorter than WS 1 and originates in the middle of the yard and directs flow towards the western boundary of the HMC.

Table 6 provides a list of the potential USACE, RWQCB, and CDFW jurisdictional areas that were delineated within the BSA.

Figure 7. Aquatic Resources Delineation (1 of 2)

Source: WRECO, 2022

Figure 8. Aquatic Resources Delineation (2 of 2)

Source: WRECO, 2022

Table 6. Potential Jurisdictional Wetlands and Waters in the BSA

Feature ID	USACE Jurisdictional Area	RWQCB Jurisdictional Area
Potential Wetlands of the U.S. (PW)		
PW 1	24,045 sq. ft 0.552 ac	24,045 sq. ft 0.552 ac
PW 2	2,701 sq. ft 0.062 ac	2,701 sq. ft 0.062 ac
PW 3	1,655 sq. ft 0.038 ac	1,655 sq. ft 0.038 ac
Potential Other Waters of the U.S. (OWUS)		
OWUS 2	3,348 sq. ft 0.077 ac 106 linear ft	3,348 sq. ft 0.077 ac 106 linear ft
Potential Non-Federal Waters of the State (WS)		
WS 1 (non-federal)	N/A	35,464 sq. ft 0.814 ac 5,542 linear ft
WS 2 (non-federal)	N/A	8,022 sq. ft 0.184 ac 997 linear ft
Riparian Habitat (RIP)		
RIP 1 (riparian habitat above OWUS 2)	N/A	3,715 sq. ft 0.085 ac 129 linear ft
Totals		
Total Wetlands.	*28,401 sq. ft* *0.652 ac*	*28,401 sq. ft* *0.652 ac*
Total Other Waters of the U.S.	*3,348 sq. ft* *0.077 ac* *106 linear ft*	*3,348 sq. ft* *0.077 ac* *106 linear ft*
Total Non-Federal Waters of the State	*0 sq. ft* *0 ac* *0 linear ft*	*3,715 sq. ft* *0.085 ac* *6,797linear ft*
Total Riparian Habitat	N/A	*3,715 sq. ft* *0.085 ac* *129 linear ft*

4.2.1.2 PROJECT IMPACTS

The construction of the bioretention basin would impact the entire PW 1 wetland area, and the proposed wetland mitigation area would impact the entire PW 3 wetland area. The conversion of the drainage to an underground culvert system, which comprises jurisdictional areas PW 2.

BART has received an Approved Jurisdictional Determination (AJD) from the USACE for portions of the drainage designated as Ditch 1 and Ditch (culverted). These two portions, accounting for 4,301 linear feet of the drainage, were determined to not fall under USACE jurisdiction.

Feature Other Waters of the U.S. (OWUS) 2 falls under USACE and RWQCB jurisdiction, and is within RWQCB and CDFW jurisdiction. Impacts to OWUS 2 are not expected to occur, but 0.009 ac (377 sq. ft) of the riparian habitat is expected to temporarily impacted by the construction of a track overpass crossing Industrial Parkway.

The entirety of the 5,542 linear feet drainage designated as WS 1 is subject to regulation under the RWQCB and CDFW. The vast majority of WS 1 will be converted to an underground culvert system, which would result in 0.760 ac (33,102 sq. ft) and 4,991 linear feet of impacts to the drainage. An additional drainage within RWQWCB jurisdiction designated as WS 2 would have 0.038 ac (1,656 sq. ft) and 210 linear feet of permanent impacts associated with the construction of a pedestrian/golf cart bridge crossing.

Table 7 below describes the impacts to each aquatic feature as well as the USACE and RWQCB jurisdictional areas.

Table 7. Potential Wetlands and Other Waters within the BSA and Proposed Impacts

Feature ID	USACE Jurisdictional Area	RWQCB Jurisdictional Area	Impacts to USACE Jurisdictional Area	Impacts to RWQCB Jurisdictional Area
Potential Wetlands of the U.S. (PW)				
PW 1	24,045 sq. ft 0.552 ac	24,045 sq. ft 0.552 ac	24,045 sq. ft 0.552 ac	24,045 sq. ft 0.552 ac
PW 2	2,701 sq. ft 0.062 ac	2,701 sq. ft 0.062 ac	2,701 sq. ft 0.062 ac	2,701 sq. ft 0.062 ac
PW 3	1,655 sq. ft 0.038 ac	1,655 sq. ft 0.038 ac	1,655 sq. ft 0.038 ac	1,655 sq. ft 0.038 ac
Potential Other Waters of the U.S. (OWUS)				
OWUS 2	3,348 sq. ft 0.077 ac 106 linear ft	3,348 sq. ft 0.077 ac 106 linear ft	None	None
Potential Non-Federal Waters of the State (WS)				
WS 1 (non-federal)	N/A	35,464 sq. ft 0.814 ac 5,542 linear ft	N/A	33,102 sq. ft 0.760 ac 4,991 linear ft
WS 2 (non-federal)	N/A	8,022 sq. ft 0.184 ac 997 linear ft	N/A	1,656 sq. ft 0.038 ac 210 linear ft
Riparian Habitat (RIP)				
RIP 1 (riparian habitat above OWUS 2)	N/A	3,715 sq. ft 0.085 ac 129 linear ft	N/A	377 sq. ft 0.009 ac 18 linear ft
Totals				
Total Wetlands	*28,401 sq. ft 0.652 ac*	*28,401 sq. ft 0.652 ac*	*28,401 sq. ft 0.652 ac*	*28,401 sq. ft 0.652 ac*
Total Other Waters of the U.S.	*3,348 sq. ft 0.077 ac 106 linear ft*	*3,348 sq. ft 0.077 ac 106 linear ft*	None	None
Total Non-Federal Waters of the State	*N/A*	*43,486 sq. ft 0.998 ac 6,539 linear ft*	*N/A*	*34,758 sq. ft 0.798 ac 5,201 linear ft*
Total Riparian Habitat	*N/A*	*3,715 sq. ft 0.085 ac 129 linear ft*	*N/A*	*377 sq. ft 0.009 ac 18 linear ft*

4.2.2 Avoidance and Minimization Measures/Compensatory Mitigation

The total impacts to wetlands would be 0.652 ac (28,401 sq. ft). No impacts to non-wetland waters of the U.S. are anticipated. Total impacts to waters of the State would be 0.798 ac (34,758 square feet) and 5,201 linear feet. Total impacts to riparian habitat under CDFW jurisdiction would be 0.009 ac (337 sq. ft) and 18 linear feet. These impacts would require compensatory mitigation. BART is in the process of locating mitigation that would be suitable to the USACE, RWQCB, and CDFW.

4.3 Special-Status Plant Species

Thirty-eight (38) special-status plant species that resulted from the combined USFWS, CNPS, and CDFW database lists for the BSA quadrangles were evaluated for potential occurrence. Reconnaissance level botanical surveys were conducted at the site on February 6, March 10, and May 19, 2020. No special-status plant species were observed in the BSA. This is likely due to the high degree of disturbance associated with the development of the UPRR tracks, BART tracks, and HMC yard.

Biologists determined it is highly unlikely special-status plants would occur in the BSA based upon the types of habitat that each listed species occupies, historical records, and observations made during focused botanical surveys. In general, historical and ongoing disturbance within the BSA has degraded the integrity of the historical vegetation communities, limiting the potential for many special-status plants to occur in the BSA.

4.4 Special-Status Wildlife

Forty (40) special-status wildlife species that resulted from the combined USFWS, and CNDDB database lists for the BSA quadrangles were evaluated for potential presence. Reconnaissance surveys were conducted during the site visits on February 6, March 10, and May 19, 2020. Based upon observations made in the field, and habitats present, there is potential for two special status species to occur; these include burrowing owl and white-tailed kite.

4.4.1 Burrowing Owl

The western burrowing owl (*Athene cunicularia*) is a California SSC (breeding) and has no federal listing status. This small owl has sandy coloring on the head, back, and upper parts of the wings and white-to-cream with barring on the breast and belly. Burrowing owls live year-round in several parts of the state, including the Central Valley. The burrowing owl lives in grassland habitat but has adapted well to some agricultural and developed areas that have suitable burrows for roosting and nesting in relatively short vegetation. Nesting habitat consists of open areas with mammal burrows, typically created by ground squirrels, but the owls can dig their own burrows in soft soil (Shuford and Gardali, 2008).

While there are no CNDDB records for burrowing owl within a 5-mile radius of the BSA, this species is highly transient and given the suitable habitat within the BSA, its potential to nest in the grasslands at the site cannot be ruled out entirely.

With the implementation of AMMs described below, the proposed Project will have no impact on burrowing owl.

4.4.1.1 AVOIDANCE AND MINIMIZATION MEASURES

In addition to the AMMs listed in Table 8, the following AMMs will be implemented to prevent Project impacts to burrowing owl:

Pre-construction nesting bird surveys during burrowing owl breeding season (February 1 through August 31) will be conducted by a qualified biologist no more than 48 hours prior to the commencement of construction. If an active nest is found within 200 feet of the Project limits, the biologist will consult with CDFW to determine if additional AMMs are applicable.

Conduct Worker Environmental Awareness Training regarding potential sensitive species that could occur in or near the BSA, including burrowing owl.

No impacts are anticipated, and no compensatory mitigation is proposed.

4.4.2 White-tailed Kite

The white-tailed kite (*Elanus leucurus*) is a state, fully protected (FP) species and is also protected under the federal MBTA. This white hawk can be observed foraging for rodents while hovering above open grasslands, agricultural fields, and wetlands. In California, the white-tailed kite ranges from the coastline east to the Sierras and is patchily distributed from Eureka to the southern California border. They are mostly year-round residents but move in response to prey abundance (Moore, 2000).

White-tailed kites take cover and build nests in trees and tall shrubs with dense canopies. Their nests are situated near open foraging areas and are constructed of loosely piled sticks and twigs in the fork near the top of a tree or bush (Polite, 2005). Suitable nesting trees are present in the residential areas immediately east of the HMC property.

During February 2020 field surveys, a pair of kites were observed displaying courtship behavior. They appeared to be searching for a suitable nesting tree. During surveys conducted in May 2020 the pair were observed foraging and returning frequently to a nest in a tall tree in the back yard of a residence located approximately 50 feet east of the UPRR tracks. There is a high potential that they will continue to nest in the vicinity.

4.4.2.1 AVOIDANCE AND MINIMIZATION MEASURES

In addition to the AMMs listed in Table 8, the following AMMs will be implemented to prevent Project impacts to white-tailed kite:

- Pre-construction nesting bird surveys during kite breeding season (February 1 through August 31) will be conducted by a qualified biologist no more than 48 hours prior to the commencement of construction. If an active nest is found within 300 feet of the Project limits, the biologist will establish a protective buffer zone along the edge of the 300 feet radius The buffer zones will be delineated with high-visibility environmentally sensitive area (ESA) fencing or demarcated with pin flags or ribbon, as applicable based on-site conditions. If it becomes necessary for work to occur in closer proximity to a nest, the Project biologist may develop a nest monitoring plan in coordination with BART that will include continual monitoring of the nest as construction moves closer. If at any time the biologist determines that activities may cause nest abandonment, construction activity in that area must cease.

Conduct Worker Environmental Awareness Training regarding potential sensitive species that could occur in or near the BSA, including white-tailed kite.

4.5 Pallid Bat

The pallid bat (*Antrozous pallidus*) is a State species of special concern. It occurs throughout most of California in lower elevations in a wide variety of habitats including grasslands, shrublands, woodlands, and forests. Day roost and hibernation roost sites include caves, rock or bridge crevices, buildings, and hollow trees. At night they roost usually in the open near foliage or in open buildings. Pallid bats leave their day roost an hour after sunset capturing their prey on vegetation or on the ground. They hibernate in the winter near the summer day roost. Maternity colonies form in early April and may have between a dozen to 100 individuals (Harris 2005). The young are born between April to July.

The only CNDDB records for pallid bat are from museum specimens (#129, #130) with vague collection data though this does not rule out the potential presence of this species in the Project vicinity because bat surveys may not have been conducted in the area. There is a low potential that pallid bats could roost in crevices beneath the BART overpass over Industrial Boulevard. The noise and vibration caused by the frequent BART train crossings make it unlikely that they would roost in the structure.

4.5.1.1 AVOIDANCE AND MINIMIZATION MEASURES

The overpass structure will not be altered. Work near the structure will occur immediately east. If pallid bats are roosting in the structure, it is not likely that construction activity would disturb them because the area is highly trafficked.

4.6 Migratory Birds

Under the MBTA and California F.G.C. Sections 3503 and 3800, migratory birds, their nests, and eggs are protected from disturbance or destruction. All birds are protected under the MBTA and except for non-native species such as the European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), and rock pigeon (*Columbia livia*), as well as game species that are subject to limited protection. Whereas, all species of birds are protected under the California F.G.C.

Birds protected by the MBTA and California F.G.C. Sections 3503 and 3800 were observed within the BSA. No focused nesting surveys have been conducted for the purposes of this report.

4.6.1 Avoidance and Minimization Efforts

The following AMMs will be implemented to reduce potential impacts to nesting birds:

- If Project work occurs during the bird nesting season (February 1 – August 31), pre-construction nesting bird surveys will be conducted prior to the removal of trees or vegetation. If an active bird nest is identified, a protective buffer will be established around the nest. The standard buffer will be 50 feet for passerines (perching songbirds), 100 feet for egrets and herons, 200 feet for raptors, and 500 feet for peregrine falcon. The buffer zones will be delineated with high-visibility environmentally sensitive area (ESA) fencing or demarcated with pin flags or ribbon, as applicable based on-site conditions. If it becomes necessary for work to occur in closer proximity to a nest, the Project biologist may develop a nest monitoring plan in coordination with BART that will include continual monitoring of the nest as construction moves closer. If at any time the biologist determines that activities may cause nest abandonment, construction activity in that area must cease.
- Trees and native shrubs will be preserved in place to the extent practicable to avoid possible nest disruption.
- Conduct Worker Environmental Awareness Training regarding the MBTA and the importance of protecting migratory and nesting birds including repercussions of disrupting active nests.

No impacts are anticipated to occur to migratory nesting birds and therefore, no compensatory mitigation actions are proposed.

4.7 Roosting Bats

Several species of bats are considered Species of Concern by the State of California, including: pallid bat, Townsend's big-eared bat, spotted bat, western red bat, and western mastiff bat. In addition to bat species listed as sensitive by the resource agencies, state laws protect bats and their occupied roosts from harassment and destruction. Protection under California Law is found in the Fish and Game Code Sections 2000, 2002, 2014 and 4150, and under California Code of Regulations Section 251.1.

Bats are commonly found in association with many habitats, often with a source of water nearby that attract insects upon which bats forage. Some species of bats almost exclusively roost in hollowed trees, peeling bark, and tree foliage. These species require trees for some or all of the following activities, depending on the species: thermal regulation, predator avoidance, maternity roosting, and for resting between foraging flights. Bat species that depend on trees for roosting include:

- Yuma myotis
- western red bat
- hoary bat
- pallid bat

With the incorporation of AMMs, no impacts to roosting bats are anticipated.

4.7.1 Avoidance and Minimization Measures

Project-related impacts to sensitive bat species can be avoided or minimized by the following avoidance and minimization measures:

- To the extent practicable, structures or trees will be removed from September 1 to March 1, outside of the breeding season, so as not to disturb maternal colonies or roosts.
- Preconstruction surveys will be conducted for all areas that provide suitable bat roosting habitat including manmade structures, snags, rotten stumps, mature trees with broken limbs, exfoliating bark, dense foliage, etc. Sensitive habitat areas and roost sites will be avoided to the maximum extent practicable.
- If potential roost sites (trees, snags, etc.) are to be removed or trimmed, limbs smaller than 3 inches in diameter will be cut and the tree shall be left overnight to allow for any bats using the tree/snag for roosting time to leave and find another roost. A biological monitor will be present during the trimming or removal of trees/snags.

4.8 Trees

Applicable tree ordinances and their requirements are discussed below.

4.8.1 City of Hayward Tree Ordinance

As discussed in Mitigation Measure BIO-4 of the Project's 2011 IS/MND, mitigation shall be required for impacts to trees designated as "protected trees" in the cities of Hayward or Union City. Per the City of Hayward tree ordinance (2020), protected trees are defined in Section 10-15.13 of Article 15 as:

- Trees having a minimum trunk diameter of 8 inches measured 54 inches above the ground. For multi-trunk trees, the diameters of the three largest trunks must be added together.
- A tree or trees of any size planted as replacement for a protected tree.
- Trees of the following species that have reached a minimum of four inches diameter truck size:
    - California big leaf maple (*Acer macrophyllum*)
    - California buckeye (*Aesculus californica*)
    - Madrone (*Arbutus menziesii*)
    - Western dogwood (*Cornus nuttallii*)
    - California sycamore (*Plantanus racemosa*)
    - Coast live oak (*Quercus agrifolia*)
    - Canyon live oak (*Q. chrysolepis*)
    - Blue oak (*Q. douglassii*)
    - Oregon white oak (*Q. garryana*)
    - California black oak (*Q. kelloggi*)
    - Valley oak (*Q. lobata*)
    - Interior live oak (*Q. wislizenii*)
    - California bay (*Umbellularia californica*)

Per BIO-4, replacement trees will be a native tree species. Each removed tree meeting the above classifications will be replaced at a 1:1 ratio. Trees will be planted in locations suitable for the replacement species. Selection of the replacement sites and installation of replacement plantings will be supervised by a qualified botanist. Trees will be replaced as soon as practical after construction is completed. A qualified botanist will monitor newly planted trees at least once a year for 5 years. Each year during that period, any trees that do not survive will be replaced. Any trees planted as remediation for failed plantings will be planted as stipulated here for original plantings, and will be monitored for a period of 5 years following installation.

4.8.1.1 PROJECT IMPACTS

A total of 52 trees that fall within the City of Hayward protected trees definition will be removed. Some trimming will occur for construction access.

4.8.1.2 AVOIDANCE AND MINIMIZATION MEASURES

Tree removal will be minimized to the extent possible. Trees that remain will be protected from impacts during construction. Tree removed will be replaced at a 1:1 ratio as described in the 2011 IS/MND mitigation measure BIO-4.

4.9 Combined Avoidance and Minimization Measures

Table 8 lists all of the proposed AMMs intended to ensure that the Project is in compliance with regulations governing biological resources.

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Table 8. Avoidance and Minimization Measures

Avoidance and Minimization Measures	Description
Protect Environmentally Sensitive Areas	• Preserve and protect trees in place to the extent practicable. • Dispose of all spoils, excavated materials, and plant materials at a licensed and approved facility.
Conduct Environmental Awareness Training	• Conduct Worker Environmental Awareness Training regarding potential sensitive species that could occur in or near the BSA, including burrowing owl, white-tailed kite, migratory birds, and roosting bats.
Implement Erosion Control Measures and Storm Water Pollution Prevention Plans	Storm Water Pollution Prevention Plans (SWPPP) and erosion control BMPs would be developed to minimize any wind erosion or storm water runoff. The SWPPP will provide guidance for design staff to include provisions for sediment removal, contracts to include measures to protect sensitive areas, and to prevent and minimize stormwater and non-stormwater discharges. Protective measures would include, but are not limited to these restrictions: • No discharge of pollutants from vehicle and equipment cleaning must be allowed into storm drains or watercourses. • Vehicle and equipment fueling, and maintenance operations must be at least 50 feet away from watercourses; except at established commercial gas stations or established vehicle maintenance facility.

Table 8. Avoidance and Minimization Measures

Avoidance and Minimization Measures	Description
Implement Project Site Best Management Practices (BMP) and Water Quality Protection	• Access routes and the number and size of staging and work areas would be limited to existing paved surfaces and previously disturbed areas as practicable. • All food and food-related trash items must be placed in trash containers and removed from the site at the end of each day. • No pets, such as dogs, cats, owned by Project personnel will be allowed anywhere in the BSA during construction to prevent harassment, mortality of native plants, wildlife, or destruction of habitats. • All equipment must be maintained in staging areas to avoid leaks (e.g. automotive fluids, gasoline, oils, or solvents). Hazardous materials such as fuels, oils, solvents, etc. will be stored in sealable containers at designated locations (at least 100 feet from aquatic habitats). A Spill Response Plan (including emergency contacts) would be prepared and kept at the site to address all spill response and emergency issues. • No firearms will be allowed except for those allowed to be carried by authorized security personnel, local, State, or Federal law enforcement officials. • To the extent practicable, sediment discharge and construction runoff will be contained to the Project vicinity in areas away from watercourses, storm drains and sensitive biological areas.
Roosting bats	• To the extent practicable, trees will be removed from September 1 to March 1, outside of the breeding season, so as not to disturb maternal colonies or roosts. • Preconstruction surveys will be conducted for all areas that provide suitable bat roosting habitat including manmade structures, snags, rotten stumps, mature trees with broken limbs, exfoliating bark, dense foliage, etc. Sensitive habitat areas and roost sites will be avoided to the maximum extent possible. • If potential roost sites (trees, snags, etc.) are to be removed or trimmed, limbs smaller than 3 inches in diameter will be cut and the tree shall be left overnight to allow for any bats using the tree/snag for roosting time to leave and find another roost. A biological monitor will be present during the trimming or removal of trees/snags.

Table 8. Avoidance and Minimization Measures

Avoidance and Minimization Measures	Description
Migratory Birds	• If Project work occurs during the bird nesting season (February 1 – August 31), pre-construction nesting bird surveys will be conducted prior to the removal of trees or vegetation. If an active bird nest is identified, a protective buffer will be established around the nest. The standard buffer will be 50 feet for passerines (perching songbirds), 100 feet for egrets and herons, 200 feet for raptors, and 500 feet for peregrine falcon. The buffer zones will be delineated with high-visibility environmentally sensitive area (ESA) fencing or demarcated with pin flags or ribbon, as applicable based on-site conditions. If it becomes necessary for work to occur in closer proximity to a nest, the Project biologist may develop a nest monitoring plan in coordination with BART that will include continual monitoring of the nest as construction moves closer. If at any time the biologist determines that activities may cause nest abandonment, construction activity in that area must cease. • Trees and native shrubs will be preserved in place to the extent practicable to avoid possible nest disruption. • Conduct Worker Environmental Awareness Training regarding the MBTA and the importance of protecting migratory and nesting birds including repercussions of disrupting active nests.

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Chapter 5 Conclusions and Regulatory Determination

5.1 Federal Endangered Species Act

This Project would have no effect on federally listed plant or wildlife species. This finding has been made for all federally listed species identified in the USFWS species lists requested for the proposed Project. No critical habitat would be affected as a result of Project activities. Federal agencies with oversight on the Project will make a final effects determination based on the information provided in this document.

5.2 California Endangered Species Act

There is no potential for special-status species protected under the CESA to occur in the Project area. With the implementation of AMMs, the Project would not impact CESA-listed species.

5.3 California Environmental Quality Act

CEQA California Public Resources Code §§21000-21177 requires state agencies, local governments and special district to evaluate and disclose impacts from projects to State designated Species of Special Concern. Burrowing owl is an SSC species that could occur in the BSA. With the implementation of AMMs, the Project would not impacts fully protected species.

5.4 California Fish and Game Code – Fully Protected Species

California Fish and Game Code Sections 3511, 4700, 5050, and 5515 lists species that are fully protected. Fully protected species may not be taken or possessed at any time unless specifically allowed by CDFW. A pair of white-tailed kites, state fully protected species, are known to have nested just beyond the BSA in 2019. With the implementation of AMMs, the Project would not impact fully protected species.

5.5 Wetlands and Other Waters

Aquatic resources identified in Section 4.2.1.1 are subject to Sections 401 and 404 of the Clean Water Act, and section 1602 of the California Fish and Game Code.

BART has received an Approved Jurisdictional Determination (AJD) from USACE for the drainage with areas designated as Ditch 1 and Ditch (culverted). These portions of the drainage were found to be non-jurisdictional.

In addition to the AJD, BART also received a Preliminary Jurisdictional Determination (PJD) (see attachments to the Aquatic Resources Delineation Report in Appendix E) from USACE for the wetlands designated as PW 1 and PW 2. These wetlands were found to be jurisdictional under Section 404 of the CWA.

The total impacts to wetlands would be 0.652 ac (28,401 sq. ft). Total impacts to waters of the State would be 0.798 ac (34,758 square feet) and 5,201 linear feet. Total impacts to riparian habitat under CDFW jurisdiction would be 0.009 ac (337 sq. ft) and 18 linear feet. These impacts would require compensatory mitigation. BART is in the process of locating mitigation that would be suitable to the USACE, RWQCB, and CDFW.

5.6 Other

5.6.1 Migratory Bird Treaty Act and Fish and Game Code §§ 3503 and 3800

Numerous bird species protected under the MBTA and F.G.C. are likely to nest in structures and vegetation in the BSA. To protect nesting birds, prior to vegetation or tree removal, pre-construction nesting bird surveys will be conducted by a qualified biologist during the typical nesting season, February 1 through August 31. If an active nest is found, the biologist will establish protective buffers around the nests, which will remain in place until it is determined the nest is no longer active. The standard buffer will be 50 feet for passerines (perching songbirds), 200 feet for raptors. If a federal threatened or endangered species is found within the BSA, consultation will occur with USFWS. If a state-listed, special-status species is found that was not addressed in this BRS, consultation will occur with CDFW.

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Appendix A Project Components Exhibits

LSA

LEGEND

Project Site

Project Components

East Side Yard

Northern Mainline Connector

FIGURE 5

N

0 400 800

FEET

SOURCE: Google Maps (2021).

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BART HMC2 Project Supplemental IS/MND

Project Components

LSA

LEGEND

Project Site

FIGURE 6

0 250 500

FEET

BART HMC2 Project Supplemental IS/MND

East Side Yard

SOURCE: Microsoft Bing (2021).

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LSA

LEGEND

Project Site

FIGURE 7

N

0 250 500

FEET

SOURCE: Microsoft Bing (2021).

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BART HMC2 Project Supplemental IS/MND

Northern Mainline Connector

Appendix B Observed Plant and Wildlife Species Lists

Table 1. Observed Plant Species

Scientific Name	Common Name	Native Status
Arundo donax	Giant reed	Non-native
Avena fatua	Wild oat	Non-native
Baccharis pilularis	Coyote brush	Native
Brassica sp.	Mustard	Non-Native
Bromus hordeaceus	Soft chest	Non-native
Bromus diandrus	Ripgut brome	Non-native
Carduus pycnocephalus	Italian thistle	Non-native
Carex sp.	Sedge	Native
Centaurea solstitialis	Yellow star-thistle	Non-native
Cirsium vulgare	Bull thistle	Non-native
Conium maculatum	Poison hemlock	Non-native
Convolvulus arvensis	Field bindweed	Non-native
Cynodon dactylon	Bermuda grass	Non-native
Cynosurus echinatus	Dogtail grass	Non-native
Cyperus eragrostis	Tall flatsedge	Native
Dipsacus fullonum	Common teasel	Non-native
Distichlis spicata	Inland saltgrass	Native
Echinochloa colona	Jungle rice	Non-native
Eschscholzia californica	California poppy	Native
Foeniculum vulgare	Sweet fennel	Non-native
Hedera helix	English Ivy	Non-native
Helminthotheca echioides	Bristly ox-tongue	Non-Native

Scientific Name	Common Name	Native Status
Geranium dissectum	Cutleaf geranium	Non-native
Grindelia camporum	Common gumplant	Native
Juncus effusus	Bog rush	Native
Lactuca serriola	Prickly lettuce	Non-native
Lolium perenne	Italian ryegrass	Non-native
Lotus corniculatus	Bird's foot trefoil	Non-Native
Malva neglecta	Common mallow	Non-native
Malva nicaeensis	Bull mallow	Non-native
Phalaris aquatica	Harding grass	Non-native
Poa travialis	Rough bluegrass	Non-native
Quercus agrifolia	Coast live oak	Native
Quercus lobata	Valley oak	Native
Raphanus sativus	Wild radish	Non-native
Rumex crispus	Curly dock	Non-native
Salix sp.	Willow	Native
Schoenoplectus acutus	Hardstem bulrush	Native
Sonchus asper	Spiny sowthistle	Non-native
Sonchus oleraceus	Common sow thistle	Non-native
Toxicodendron diversilobum	Poison oak	Native
Tragopogon porrifolius	Purple salsify	Non-native
Trifolium hirtum	Rose clover	Non-native
Trifolium subterraneum	Sub clover	Non-native
Vicia sativa	Spring vetch	Non-native
Vicia tetrasperma	Slender vetch	Non-native

Table 2. Observed Plant Species

Scientific Name	*Common Name*
Mammals	
Felis catus	Feral cat
Procyon lotor	racoon
Birds	
Anas platyrhynchos	Mallard
Aeronautes saxatalis	White-throated swift
Calypte anna	Anna's hummingbird
Egretta thula	Snowy egret
Carthartes aura	Turkey vulture
Elanus leucurus	White-tailed kite
Buteo jamaicensis	Red-tailed hawk
Sayornis nigricans	Black phoebe
Corvus brachyrhynchose	American crow
Corvus corax	Common raven
Petrochelidon pyrrhonota	Cliff swallow
Sturnus vulgaris	European starling
Mimus polyglottos	Northern mockingbird
Euphagus cyanocephalus	Brewer's blackbird

Appendix C CNDDB, CNPS and USFWS Lists

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Hayward (3712261) OR San Leandro (3712262) OR Redwood Point (3712252) OR Newark (3712251) OR Dublin (3712168) OR Niles (3712158))
 AND Taxonomic Group IS (Ferns OR Gymnosperms OR Monocots OR Dicots OR Lichens OR Bryophytes)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G3	S3	1B.2
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Balsamorhiza macrolepis big-scale balsamroot	PDAST11061	None	None	G2	S2	1B.2
Campanula exigua chaparral harebell	PDCAM020A0	None	None	G2	S2	1B.2
Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1	None	None	G3T1T2	S1S2	1B.1
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2	1B.2
Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
Clarkia concinna ssp. automixa Santa Clara red ribbons	PDONA050A1	None	None	G5?T3	S3	4.3
Eryngium aristulatum var. hooveri Hoover's button-celery	PDAPI0Z043	None	None	G5T1	S1	1B.1
Eryngium jepsonii Jepson's coyote-thistle	PDAPI0Z130	None	None	G2	S2	1B.2
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Helianthella castanea Diablo helianthella	PDAST4M020	None	None	G2	S2	1B.2
Hoita strobilina Loma Prieta hoita	PDFAB5Z030	None	None	G2?	S2?	1B.1
Holocarpha macradenia Santa Cruz tarplant	PDAST4X020	Threatened	Endangered	G1	S1	1B.1
Horkelia cuneata var. sericea Kellogg's horkelia	PDROS0W043	None	None	G4T1?	S1?	1B.1
Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Monolopia gracilens woodland woollythreads	PDAST6G010	None	None	G3	S3	1B.2
Plagiobothrys glaber hairless popcornflower	PDBOR0V0B0	None	None	GX	SX	1A
Polemonium carneum Oregon polemonium	PDPLM0E050	None	None	G3G4	S2	2B.2
Polygonum marinense Marin knotweed	PDPGN0L1C0	None	None	G2Q	S2	3.1
Sanicula maritima adobe sanicle	PDAPI1Z0D0	None	Rare	G2	S2	1B.1
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3	S2	2B.2
Spergularia macrotheca var. longistyla long-styled sand-spurrey	PDCAR0W062	None	None	G5T2	S2	1B.2
Streptanthus albidus ssp. peramoenus most beautiful jewelflower	PDBRA2G012	None	None	G2T2	S2	1B.2
Stuckenia filiformis ssp. alpina northern slender pondweed	PMPOT03091	None	None	G5T5	S2S3	2B.2
Suaeda californica California seablite	PDCHE0P020	Endangered	None	G1	S1	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2

Record Count: 29

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Hayward (3712261) OR San Leandro (3712262) OR Redwood Point (3712252) OR Newark (3712251) OR Dublin (3712168) OR Niles (3712158))
 AND Taxonomic Group IS (Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Accipiter striatus sharp-shinned hawk	ABNKC12020	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S1S2	SSC
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Asio flammeus short-eared owl	ABNSB13040	None	None	G5	S3	SSC
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Bombus crotchii Crotch bumble bee	IIHYM24480	None	None	G2	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	None	G2G3	S1	
Charadrius nivosus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2	SSC
Circus hudsonius northern harrier	ABNKC11011	None	None	G5	S3	SSC
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
Coturnicops noveboracensis yellow rail	ABNME01010	None	None	G4	S1S2	SSC
Danaus plexippus pop. 1 monarch - California overwintering population	IILEPP2012	Candidate	None	G4T2T3	S2S3	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G4G5T4	S3S4	SSC
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T3	S3	SSC
Gonidea angulata western ridged mussel	IMBIV19010	None	None	G3	S1S2	
Lasiurus cinereus hoary bat	AMACC05030	None	None	G3G4	S4	
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3T1	S1	FP
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3S4	
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Masticophis lateralis euryxanthus Alameda whipsnake	ARADB21031	Threatened	Threatened	G4T2	S2	
Melospiza melodia pusillula Alameda song sparrow	ABPBXA301S	None	None	G5T2T3	S2S3	SSC
Microcina lumi Lum's micro-blind harvestman	ILARA47050	None	None	G1	S1	
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	
Nannopterum auritum double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	AMAFF08082	None	None	G5T2T3	S2S3	SSC
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S4	
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
Pomatiopsis californica Pacific walker	IMGASJ9020	None	None	G1	S1	
Rallus obsoletus obsoletus California Ridgway's rail	ABNME05011	Endangered	Endangered	G3T1	S1	FP
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Rynchops niger black skimmer	ABNNM14010	None	None	G5	S2	SSC
Scapanus latimanus parvus Alameda Island mole	AMABB02031	None	None	G5T1Q	SH	SSC
Setophaga petechia yellow warbler	ABPBX03010	None	None	G5	S3S4	SSC
Sorex vagrans halicoetes salt-marsh wandering shrew	AMABA01071	None	None	G5T1	S1	SSC
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Sternula antillarum browni California least tern	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2	FP
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2	S2	
Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2	S2	

Record Count: 49

California Native Plant Society

Search Results

37 matches found. Click on scientific name for details

Search Criteria: Quad is one of [**3712261:3712262:3712252:3712251:3712158:3712168**]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	PHOTO
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	Mar-Jun	None	None	G3	S3	1B.2	 © 2011 Neal Kramer
Astragalus tener var. *tener*	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G2T1	S1	1B.2	No Photo Available
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	None	None	G2	S2	1B.2	 ©1998 Dean Wm. Taylor
Calochortus umbellatus	Oakland star-tulip	Liliaceae	perennial bulbiferous herb	Mar-May	None	None	G3?	S3?	4.2	No Photo Available
Campanula exigua	chaparral harebell	Campanulaceae	annual herb	May-Jun	None	None	G2	S2	1B.2	No Photo Available
Castilleja ambigua var. *ambigua*	johnny-nip	Orobanchaceae	annual herb (hemiparasitic)	Mar-Aug	None	None	G4T4	S3S4	4.2	 ©2011 Dylan Neubauer
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	Asteraceae	annual herb	May-Oct(Nov)	None	None	G3T1T2	S1S2	1B.1	No Photo Available
Chloropyron maritimum ssp. *palustre*	Point Reyes salty bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Oct	None	None	G4?T2	S2	1B.2	 ©2017 John Doyen
Chorizanthe robusta var. *robusta*	robust spineflower	Polygonaceae	annual herb	Apr-Sep	FE	None	G2T1	S1	1B.1	No Photo Available
Clarkia concinna ssp. *automixa*	Santa Clara red ribbons	Onagraceae	annual herb	(Apr)May-Jun(Jul)	None	None	G5?T3	S3	4.3	No Photo Available
Eriogonum umbellatum var. *bahiiforme*	bay buckwheat	Polygonaceae	perennial herb	Jul-Sep	None	None	G5T3	S3	4.2	No Photo Available
Eryngium aristulatum var. *hooveri*	Hoover's button-celery	Apiaceae	annual/perennial herb	(Jun)Jul(Aug)	None	None	G5T1	S1	1B.1	No Photo Available
Eryngium jepsonii	Jepson's coyote-thistle	Apiaceae	perennial herb	Apr-Aug	None	None	G2	S2	1B.2	No Photo Available
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	No Photo Available
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	None	None	G2	S2	1B.2	 © 2004 Carol W. Witham
Gilia millefoliata	dark-eyed gilia	Polemoniaceae	annual herb	Apr-Jul	None	None	G2	S2	1B.2	

										© 2017 John Doyen
Helianthella castanea	Diablo helianthella	Asteraceae	perennial herb	Mar-Jun	None	None	G2	S2	1B.2	 © 2013 Christopher Bronny
Hoita strobilina	Loma Prieta hoita	Fabaceae	perennial herb	May-Jul(Aug-Oct)	None	None	G2?	S2?	1B.1	 © 2004 Janell Hillman
Holocarpha macradenia	Santa Cruz tarplant	Asteraceae	annual herb	Jun-Oct	FT	CE	G1	S1	1B.1	 © 2011 Dylan Neubauer
Horkelia cuneata var. *sericea*	Kellogg's horkelia	Rosaceae	perennial herb	Apr-Sep	None	None	G4T1?	S1?	1B.1	 © 2018 Neal Kramer
Lasthenia conjugens	Contra Costa goldfields	Asteraceae	annual herb	Mar-Jun	FE	None	G1	S1	1B.1	 © 2013 Neal Kramer
Leptosiphon acicularis	bristly leptosiphon	Polemoniaceae	annual herb	Apr-Jul	None	None	G4?	S4?	4.2	 © 2007 Len Blumin
Leptosiphon ambiguus	serpentine leptosiphon	Polemoniaceae	annual herb	Mar-Jun	None	None	G4	S4	4.2	 © 2010 Aaron Schusteff
Leptosiphon grandiflorus	large-flowered leptosiphon	Polemoniaceae	annual herb	Apr-Aug	None	None	G3G4	S3S4	4.2	 © 2003 Doreen L. Smith
Monolopia gracilens	woodland woollythreads	Asteraceae	annual herb	(Feb)Mar-Jul	None	None	G3	S3	1B.2	 © 2016 Richard Spellenberg
Piperia michaelii	Michael's rein orchid	Orchidaceae	perennial herb	Apr-Aug	None	None	G3	S3	4.2	No Photo Available
Plagiobothrys glaber	hairless popcornflower	Boraginaceae	annual herb	Mar-May	None	None	GX	SX	1A	No Photo Available
Polemonium carneum	Oregon polemonium	Polemoniaceae	perennial herb	Apr-Sep	None	None	G3G4	S2	2B.2	 ©2018 John Doyen
Polygonum marinense	Marin knotweed	Polygonaceae	annual herb	(Apr)May-Aug(Oct)	None	None	G2Q	S2	3.1	No Photo Available
Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb (aquatic)	Feb-May	None	None	G4	S3	4.2	No Photo Available
Sanicula maritima	adobe sanicle	Apiaceae	perennial herb	Feb-May	None	CR	G2	S2	1B.1	No Photo Available

										Available
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	Jan-Apr(May)	None	None	G3	S2	2B.2	No Photo Available
Spergularia macrotheca var. *longistyla*	long-styled sand-spurrey	Caryophyllaceae	perennial herb	Feb-May	None	None	G5T2	S2	1B.2	No Photo Available
Streptanthus albidus ssp. *peramoenus*	most beautiful jewelflower	Brassicaceae	annual herb	(Mar)Apr-Sep(Oct)	None	None	G2T2	S2	1B.2	 © 1994 Robert E. Preston, Ph.D.
Stuckenia filiformis ssp. *alpina*	northern slender pondweed	Potamogetonaceae	perennial rhizomatous herb (aquatic)	May-Jul	None	None	G5T5	S2S3	2B.2	 Dana York (2016)
Suaeda californica	California seablite	Chenopodiaceae	perennial evergreen shrub	Jul-Oct	FE	None	G1	S1	1B.1	No Photo Available
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.2	No Photo Available

Showing 1 to 37 of 37 entries

Suggested Citation:
California Native Plant Society, Rare Plant Program. 2022. Rare Plant Inventory (online edition, v9-01 1.5). Website https://www.rareplants.cnps.org [accessed 18 May 2022].

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: May 18, 2022
Project Code: 2022-0043953
Project Name: Hayward Maintenance Complex (Phase 2) Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Project Code: 2022-0043953
Event Code: None
Project Name: Hayward Maintenance Complex (Phase 2) Project
Project Type: Railroad - New Construction
Project Description: San Francisco Bay Area Rapid Transit District (BART) proposes to construct the Hayward Maintenance Complex (Phase 2) Project (HMC2 Project), an element of the HMC Project, which was environmentally evaluated under California Environmental Quality Act (CEQA) with an Initial Study/Mitigated Negative Declaration in 2011. The HMC2 Project is subdivided into two major components, the East Side Vehicle Storage Yard and the Northern Mainline Connector.

The East Side Vehicle Storage Yard, the first component of the HMC2 Project, includes a vehicle storage yard capable of storing approximately 250 BART vehicles. The need for the East Side Vehicle Storage Yard is driven by BART's plan to increase its fleet size to accommodate a growing demand for reliable and more frequent train service to/from downtown San Francisco and Oakland.

It is estimated that construction activities will commence in summer 2024 and extend through early 2028.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.61495695,-122.0432212089792,14z

Counties: Alameda County, California

Endangered Species Act Species

There is a total of 14 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
Alameda Whipsnake (=striped Racer) *Masticophis lateralis euryxanthus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5524	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
California Seablite *Suaeda californica*	Endangered
Population:	
No critical habitat has been designated for this species.	
Species profile: https://ecos.fws.gov/ecp/species/6310	
Contra Costa Goldfields *Lasthenia conjugens*	Endangered
There is **final** critical habitat for this species. The location of the critical habitat is not available.	
Species profile: https://ecos.fws.gov/ecp/species/7058	
Santa Cruz Tarplant *Holocarpha macradenia*	Threatened
There is **final** critical habitat for this species. The location of the critical habitat is not available.	
Species profile: https://ecos.fws.gov/ecp/species/6832	

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency: County of Alameda
Name: Ashley Chan
Address: 1243 Alpine Road Suite 108
City: Walnut Creek
State: CA
Zip: 94596
Email ashley.chan@hdrinc.com
Phone: 9253959519

Appendix D Representative Photos

Photo 1. PW 1, Looking Northwest.

Photo 2. PW 1, Looking South over Project Site. Photo taken 2/6/20

Photo 3. PW 2, Looking South.

Photo 4. WS 1, Look South. **Photo taken 2/6/20**

Photo 5. WS 1, Look Northwest. **Photo taken 2/6/20**

Photo 5. OWUS 1, Facing Southwest. **Photo taken 2/6/20**

Photo 6. Potential Secondary Staging Area Photo taken 3/10/20

Appendix E Aquatic Resources Delineation

N

0 345 690 Feet

Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Aquatic Resources Delineation (1 of 2)

Hayward Maintenance Complex Phase 2 Project

Cities of Union City and Hayward, Alameda County, California

Prepared For: BART

Prepared By: WRECO

N

0 425 850 Feet

Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Aquatic Resources Delineation (2 of 2)

Hayward Maintenance Complex Phase 2 Project

Cities of Union City and Hayward, Alameda County, California

Prepared For: BART

Prepared By: WRECO

APPENDIX D

SECTION 4(F) ANALYSIS

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SECTION 4(F) EVALUATION

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT
HAYWARD MAINTENANCE COMPLEX PHASE 2
PROJECT

HAYWARD, CA

LSA

June 2022

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SECTION 4(F) EVALUATION

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT HAYWARD MAINTENANCE COMPLEX PHASE 2 PROJECT

HAYWARD, CA

Submitted to:

San Francisco Bay Area Rapid Transit District
2150 Webster Street
Oakland, CA 94612

Prepared by:

LSA
157 Park Place
Pt. Richmond, California 94801

June 2022

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TABLE OF CONTENTS

FIGURES AND TABLES

FIGURES

TABLES

1.0 INTRODUCTION

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 49 United States Code (U.S.C.) 303, declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreational lands, wildlife and waterfowl refuges, and historic sites."

Section 4(f) specifies that the Secretary of Transportation may approve a transportation project requiring the use of publicly owned land of a public park, recreational area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the federal, State, or local officials having jurisdiction over the park, refuge, or site) only if:

- There is no prudent and feasible alternative to using that land; and
- The project includes all possible planning to minimize harm to the park, recreational area, wildlife and waterfowl refuge, or historic site resulting from the use.

This Section 4(f) Evaluation identifies the Section 4(f) resources in and near the San Francisco Bay Area Rapid Transit District (BART) Hayward Maintenance Complex Phase 2 Project (HMC2 Project or the proposed project) study area. The objectives of this analysis are to describe the regulatory setting, affected environment, impacts on Section 4(f) resources, and measures to minimize harm to the affected resources.

BART proposes to construct the HMC2 Project, which includes two major components – the East Storage Yard and the Northern Mainline Connector. The East Storage Yard would include vehicle storage for approximately 250 BART vehicles, as well as ancillary wayside and maintenance facilities. The Northern Mainline Connector would consist of a new trackway connection between the East Storage Yard and the BART mainline trackway. The purpose of the HMC2 Project is to expand vehicle storage capacity and improve BART operations at the existing HMC facility.

The project is subject to state and federal environmental review requirements because it involves the use of federal funds from the Federal Transit Authority (FTA). A Supplemental Initial Study/Mitigated Negative Declaration (Supplemental IS/MND) has been prepared for the proposed project in compliance with the California Environmental Quality Act (CEQA), and a Categorical Exclusion will be requested for the National Environmental Policy Act (NEPA). BART is the CEQA lead agency, and FTA is the NEPA lead agency. This Section 4(f) Evaluation has been prepared as part of the technical analysis required to support the NEPA Categorical Exclusion.

The proposed project would result in the "use" of property protected by Section 4(f) as defined in Code of Federal Regulations (CFR) 774.17 (see Section 5.0); therefore, documentation of compliance with Section 4(f) is required.

The following technical reports, prepared as part of the environmental document for the project, were used in support of the evaluation presented in this report:

- Air Quality Study, LSA, December 2021
- Noise & Vibration Technical Study, LSA, December 2021
- Biological Study Report, WRECO, December 2021
- Cultural Resources Study, LSA, January 2022

1.1 PROJECT LOCATION AND SETTING

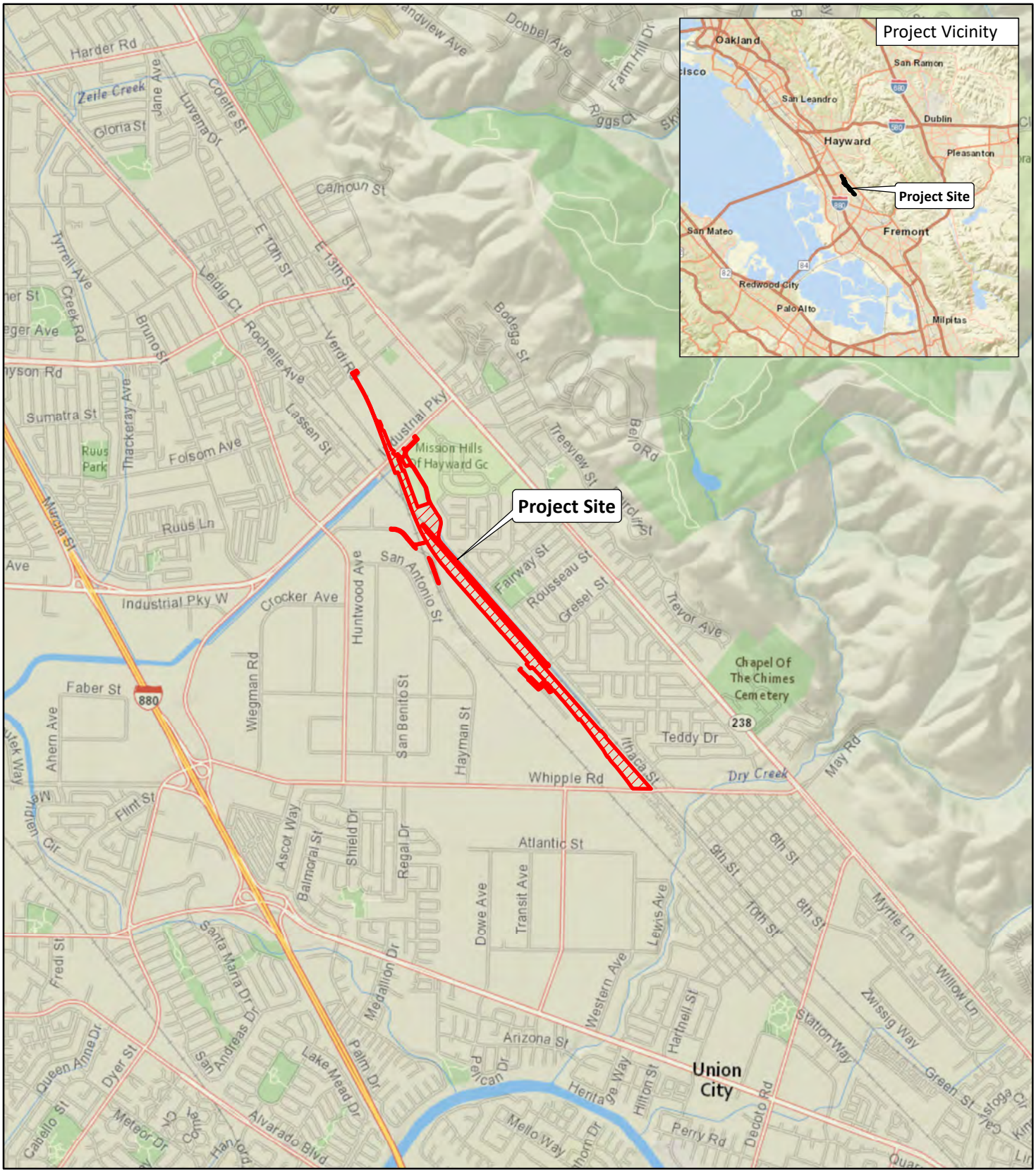
The HMC2 Project site is located at the north-eastern end of the HMC and consists of approximately 55 acres of land including portions of the existing HMC property and BART right-of-way north of Industrial Parkway. The majority of proposed improvements would be located within the HMC property, on the east side of the mainline BART tracks north of the existing maintenance and engineering facility and rail storage yard. The project site is bound by the Union Pacific Railroad (UPRR) Niles Subdivision rail line and Mission Hills of Hayward Golf Course Driving Range (golf course driving range) on the east, the BART Mainline and Hayward Test Track to the west, and the BART Rail Storage Yard to the south. The long linear corridor would extend approximately 3,600 feet north from the vehicle storage area to north of Industrial Parkway.

The project site primarily consists of undeveloped property located north of the BART Rail Storage Yard, where the East Storage Yard is proposed. The proposed facility would provide storage for approximately 250 rail vehicles and would also feature ancillary wayside and maintenance facilities needed for a fully functional, electrified, storage yard. Further north within the same undeveloped property and west of the Mission Hills of Hayward Golf Course driving range is the area where the Northern Mainline Connector is proposed. These areas consist of grasslands, with sparse patches of trees and bushes, low-lying wetland areas, a linear man-made drainage ditch, and a narrow corridor adjacent to the existing BART test track. As described further below, the project site also includes a portion of the golf course driving range. The regional location and limits of the proposed project site are shown on Figures 1 and 2, respectively.

1.2 PURPOSE AND NEED

BART has been in operation since 1972 and currently operates in five Bay Area counties. It operates and maintains 131 miles of revenue track and 50 stations serving an average of 405,000 passenger trips on an average weekday (prior to the Covid-19 pandemic). The most recent extension to the BART system was to the Berryessa/North San Jose Station in San Jose, which opened in June 2020.

The BART fleet has 669 legacy revenue vehicles and has ordered 775 “Fleet of the Future” cars. The first Fleet of the Future train carried passengers in January 2018. The size of BART's fleet will be dynamic while new trains are put into service and old trains are retired. The current forecast



LSA

LEGEND

Project Site

FIGURE 1

0 1500 3000

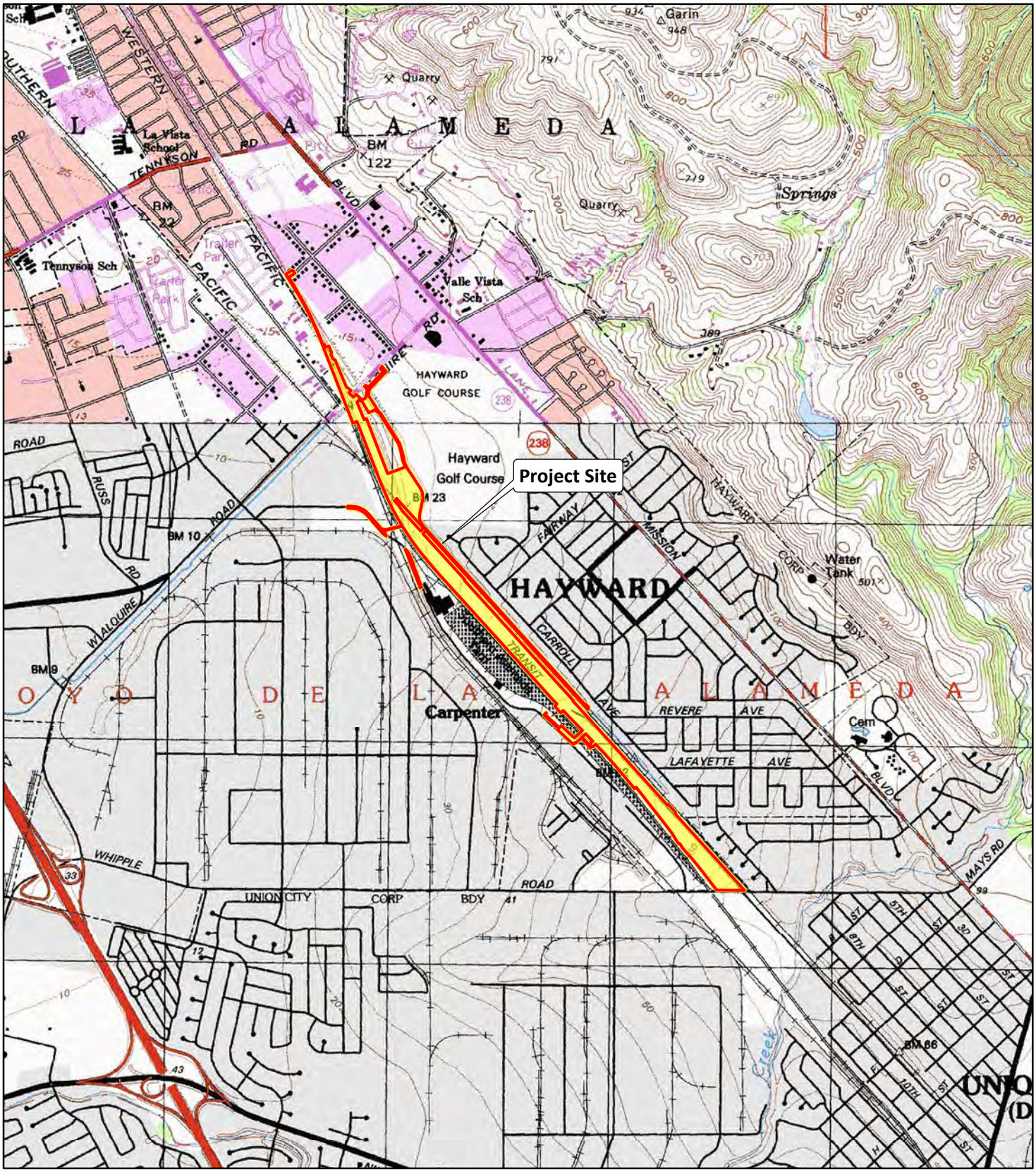
FEET

SOURCE: National Geographic (2020); Esri World Street Map (2020); Jacobs (07/2021); PGH Wong Eng (12/2021).

I:\WRO2001\GIS\Maps\Cultural\Figure 1_Regional Location and Vicinity.mxd (5/27/2022)

BART HMC2 Project Section 4(f) Evaluation

Regional Location and Vicinity



LSA

LEGEND

Project Site

FIGURE 2

N

0 1000 2000

FEET

BART HMC2 Project Section 4(f) Evaluation

Project Site

SOURCE: Jacobs (07/2021); PGH Wong Eng (12/2021);
USGS 7.5-minute Topo Quads - *Newark, Calif.* (1993) and *Hayward, Calif.* (1990).

I:\WRO2001\GIS\Maps\Cultural\Figure 2_Project Site.mxd (5/27/2022)

indicates the balance of new train cars will be delivered by Spring 2022.[1] Approximately 620 vehicles are in service on a typical day. BART's current fleet of 728 revenue vehicles can all be stored within the four existing yards associated with the four vehicle maintenance shops. As the fleet expands to meet future needs, additional maintenance and storage will be necessary, both to accommodate the expected number of cars and to minimize non-revenue train movements to initiate and end daily service.

Maintenance will also need to be expanded to ensure future reliability and performance. BART has instituted a Strategic Maintenance Program (SMP) that will provide scheduled maintenance and overhauls for the vehicle fleet. The acquisition of the three properties (with four warehouses) adjacent to Hayward Yard (HMC Phase 1) created an efficient complex that could provide the necessary maintenance and also allow a consolidation of existing BART services.

As part of the Transbay Corridor Core Capacity Program, BART has prioritized three interrelated capital investment initiatives to ensure the system can safely, efficiently, and comfortably serve current and new riders. Collectively these projects are known as the "Big 3" and include the following:

- The Fleet of the Future (FOTF) – New rail vehicles to replace BART's current fleet
- Communications Based Train Control (CBTC) – An improved train control system to enable trains to operate more frequently
- The Hayward Maintenance Complex (Phase 2) (HMC2) Project – creates a new storage yard facility east of the existing Hayward Maintenance Complex to store the expanded fleet

The "Big 3" together can address some key current bottlenecks that hinder BART's ability to meet current and future ridership growth. The HMC2 consists of both East Storage Yard and the Northern Mainline Connector. These projects are located on the undeveloped land east of the Hayward Maintenance Complex and will provide an economical means to expand vehicle storage on a suitable and vacant land, which BART already owns.

1.2.1 Project Objectives

The objectives for the proposed project are to:

- Provide additional storage tracks for approximately 250 additional BART cars.
- Provide increased flexibility for BART operations by allowing some maintenance operations that now occur on the west side of the mainline to be conducted at the East Storage Yard.

[1] San Francisco Bay Area Rapid Transit District (BART), 2021. "System Facts" website: www.bart.gov/about/history/facts (accessed July 30, 2021).

- Increase flexibility for BART operations by providing a direct and efficient rail connection from the East Storage Yard to the BART northbound mainline via the Northern Mainline Connector.

2.0 PROJECT DESCRIPTION

The following describes the proposed HMC2 Project (proposed project) that would include development of key features within the East Storage Yard and construction of the Northern Mainline Connector to provide a new trackway connection between the East Storage Yard and the BART mainline trackway.

2.1 PROPOSED PROJECT

The proposed project consists of two major components: the East Storage Yard and the Northern Mainline Connector. These two project components are described in further detail below. Figure 3 shows the two project components.

2.1.1 East Storage Yard

The East Storage Yard, the first component of the HMC2 Project, includes a vehicle storage yard capable of storing approximately 250 BART vehicles. The need for the East Storage Yard is driven by BART's plan to increase its fleet size to accommodate a growing demand for reliable and more frequent train service to/from downtown San Francisco and Oakland.

The East Storage Yard also features ancillary wayside and maintenance facilities needed for a fully functional, electrified, storage yard. Environmental impacts of the East Storage Yard project component were evaluated under CEQA in 2011; however, several key features were not fully addressed or developed in the 2011 IS/MND. These features, along with the Northern Mainline Connector component, form the basis of the proposed Project. Figure 4 shows the East Storage Yard Project Components. Key features of the East Storage Yard are as follows:

- **Drainage.** An existing open drainage channel that extends the length of the proposed East Storage Yard and the existing rail storage yard and maintenance facilities almost to Whipple Road would be filled. The length of the fill would be approximately 4,781 linear feet, and the surface area of the fill would be approximately 33,102 square feet (0.76 acres). The amount of fill required would be approximately 18,900 cubic yards. Replacement of the drainage channel is needed for the construction of a perimeter access road, which would provide for maintenance and emergency vehicles egress through the storage yard.

  A second drainage ditch, which originates in the middle of the yard and directs flow towards the western boundary of the HMC, would be partially filled to accommodate construction of the pedestrian/golf cart bridge crossing. The length of fill would be approximately 210 linear feet and the surface area of fill would be approximately 1,656 square feet (0.038 acre). A detoured culvert around the filled portion of the ditch will maintain its functionality for proper drainage.

- **Car Cleaning Platform.** A car cleaning platform would be provided within the storage yard. The car cleaning platform would allow car cleaners to access trains at vehicle door height, similar to typical passenger platforms. Canopies, mop sinks, and storage cabinets would also be provided along the cleaning platform. The dimensions of the platform would be approximately 700 long by 11 feet wide.

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LSA

LEGEND

Project Site

Project Components

East Storage Yard

Northern Mainline Connector

FIGURE 3

0 400 800

FEET

SOURCE: Google Maps (2021).

I:\WRO2001\GIS\Maps\IS-MND\Figure 5_Project Components.mxd (5/27/2022)

BART HMC2 Project Section 4(f) Evaluation

Project Components

LSA

LEGEND

Project Site

FIGURE 4

0 250 500

FEET

BART HMC2 Project Section 4(f) Evaluation

East Side Yard

SOURCE: Microsoft Bing (2021).

I:\WRO2001\GIS\Maps\IS-MND\Figure 6_East Side Yard.mxd (1/22/2022)

- **Cart Bridge Overcrossing.** An overcrossing structure would provide access for personnel carts and pedestrians to allow workers to traverse between the East Vehicle Storage Yard and the existing Hayward Yard. The cart bridge overcrossing would be approximately 780 feet long and 20 feet above the ground.

- **Extension of Whistle Stop Structure.** The existing Whistle Stop Structure would be extended to the east to allow Train Operators to cross over the Hayward Test Track and access the East Vehicle Storage Yard. The Whistle Stop Structure would also allow for additional pedestrian movement between the existing Hayward Yard and the East Side Vehicle Storage Area. The Whistle Stop Structure would be approximately 100 feet long by 5 feet wide.

- **Traction Power Substation.** A Traction Power Substation (TPSS) would be located in the East Vehicle Storage Yard. The TPSS would provide power to the storage yard. The dimensions of the TPSS would be 180 feet long by 70 feet wide by 12 feet high.

- **Train Operator Facility/Car Cleaner/Cart Charging Facility.** A two-story administrative building would provide work and break facilities for Car Cleaners and Train Operators. The facility would be located on the south end of the East Vehicle Storage Yard and would also include facilities to allow for the charging of electric carts. The facility would be approximately 8,600 square feet and 12 feet long by 40 feet wide by 32 feet high.

- **Ditch Restoration.** The East Storage Yard component would include a narrow linear area approximately 500 feet long located within the Hayward Maintenance Complex that is bounded by Sandoval Way on the east and the UPRR Niles Subdivision rail line on the west, which would accommodate proposed restoration of an existing ditch as mitigation for wetland impacts, if needed.

2.1.2 Northern Mainline Connector

The Northern Mainline Connector would consist of a new trackway connection between the East Storage Yard and the BART mainline trackway. The Northern Mainline Connector would also include the relocation of the western fence[1] of the golf course driving range to a location further to the east to allow for the construction of new trackway. Key features of the Northern Mainline Connector are shown in Figure 5 and described as follows:

- **Extended Trackway.** The BART tracks would be extended from the vehicle storage area north to Industrial Parkway, approximately 3,600 feet, to a point approximately 700 feet north of Industrial Parkway. A combination of turnouts and crossovers[2] would be installed, including three crossovers and eight turnouts that would be north of the vehicle storage yard.

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1 The driving range fence consists of black safety netting and associated steel support poles that extend approximately 120 feet above ground level.

2 A crossover is defined as a pair of switches that connects two parallel rail tracks, allowing a train on one track to cross over to the other. A turnout is a mechanical device used to guide the trains from one rail track to another.

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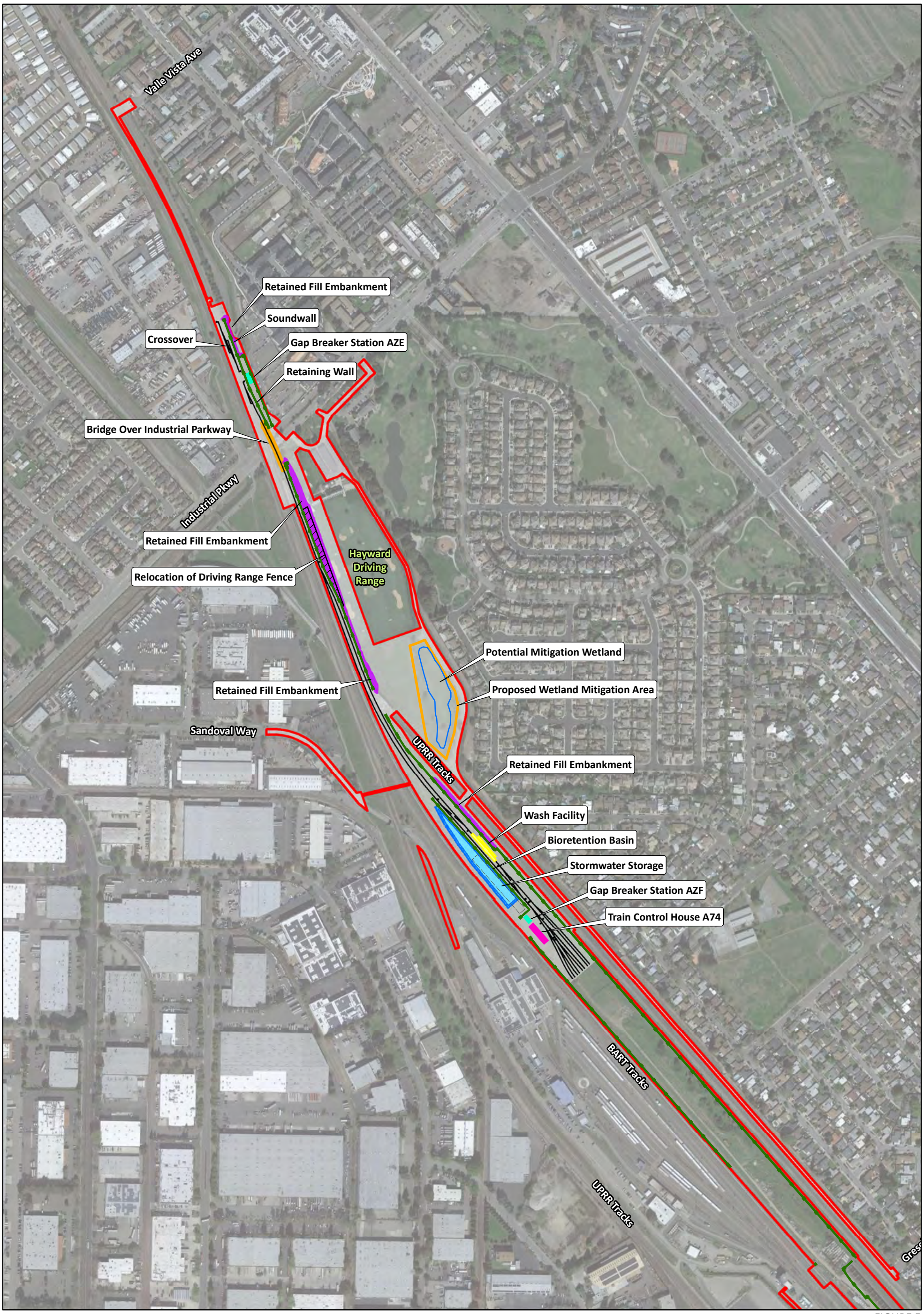

LSA

FIGURE 5

SOURCE: Microsoft Bing (2021).

I:\WRO2001\GIS\Maps\IS-MND\Figure 7_Northern Mainline Connector.mxd (5/27/2022)

BART HMC2 Project Section 4(f) Evaluation

Northern Mainline Connector

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- **Retained Fill Embankment.** A retained fill embankment would be constructed to carry the connecting tracks north from the storage tracks to the UPRR tunnel and from the UPRR tunnel to approximately 700 feet north of Industrial Parkway. The retained fill embankment would be approximately 3,600 feet (0.68 miles) long, 25 to 50 feet wide, and 25 feet high at the highest location. Between the UPRR tracks on the east and the BART test track on the west, the embankment would be constructed between two retaining walls and would carry a series of tracks from the East Storage Yard that would converge to just one track connecting to the BART mainline north of Industrial Parkway. The embankment would also carry a service road parallel to the tracks. The embankment would be lighted with shielded security lights 15 to 18-feet high.

- **Bridge Overcrossing of Industrial Parkway.** A new bridge overcrossing structure would be constructed over Industrial Parkway to carry the new Northern Connecter trackway. The structure would be approximately 250 feet long, 24 feet wide, and 23 feet high and would be supported by columns placed in the median and either side of the roadway.

- **Sound wall.** A 600-foot long, 10-foot-high sound wall (5 feet above top of rail) would be constructed along the east side the Northern Connector tracks north of Industrial Parkway to reduce noise generated by nearby crossovers.

- **Drainage.** Underground culvert pipes would replace portions of an existing open culvert/linear ditch at the south end of Northern Mainline Connector site along the west side to allow for the construction of a perimeter access road, which would provide access for emergency vehicles throughout the storage yard and to accommodate a Gap Breaker Station and a Train Control House.

- **Bioretention Basin.** A bioretention basin would be located between the retained fill embankment on the east and the BART test tracks on the west. Its dimensions would be approximately 580 feet long by approximately 50 feet wide by 4 feet deep. The bioretention basin would have an area of approximately 29,000 square feet and a capacity of approximately 44,000 cubic feet of stormwater storage. Flows from the Phase 1 (west side of Hayward maintenance yard) and Phase 2 (East Side Storage Area) would be conveyed by gravity into the bioretention basin.

- **Stormwater Storage.** In addition to the bioretention basin, the proposed Project would include stormwater storage to accommodate runoff from the Phase 1 area (west side of the mainline tracks) of the Hayward Yard. Stormwater from the Phase 1 area would be conveyed to storage culverts beneath the proposed bioretention basin. The storage facility would consist of four side-by-side box culverts that would be cross-connected to act as a single storage unit. The combined culvert dimensions would be approximately 40 feet wide by 8 feet deep by 400 feet long and would provide approximately 100,000 cubic feet of storage. Stormwater runoff from the Phase 1 site would flow to a bypass structure on the site, where Phase 1 flows would be stored in the box culverts and excess storm flows would be conveyed to an existing outfall. Once a storm event has passed and there is capacity in the bioretention basin, a pump station would lift the Phase 1 flows into the bioretention basin for treatment and eventual discharge to an

existing outfall on the eastern side of the UPRR tracks. Pump stations and piping for this component would be provided as part of the proposed Project.

- **Jack and Bore 30-Inch Storm Drain**. A 30-inch storm drain culvert would be installed via jack and bore underneath the UPRR Niles Subdivision tracks to connect to an existing culvert east of the UPRR tracks. The existing culvert outlets to an Alameda County Flood Control District (ACFCD) channel. Approximately 200 feet of the storm drain would be jacked and bored. The existing drainage outfall to the ACFCD channel would not be impacted by construction activities.

- **Jack and Bore Sanitary Sewer**. An 8-inch sanitary sewer would be installed via jack and bore underneath the UPRR Oakland Subdivision, BART Hayward Test Track, and BART mainline trackways to provide a connection to an existing sanitary sewer system located on Sandoval Way.

- **Underground Utilities.** Power, water, sanitary sewer, and communications would be extended from the existing connections to the expansion area.

- **Traction Power, Train Control, and Communications Systems.** Embedded electrical conduit for traction power would be provided for power and communications circuits. A third rail to provide power to tracks and to power the vehicles would be installed.

- **Gap Breaker Stations**. Two gap breaker stations, one at the north end of the connecting tracks adjacent to the east side of the BART tracks north of Industrial Parkway and another at the south end of the Northern Mainline Connector tracks would be installed. These facilities would be approximately 1,000 square feet in size and provide for continuity in and the ability to isolate sections of contact rail. The gap breaker stations would be approximately 56 feet long by 20 feet wide by 13 feet high.

- **Train Control House.** A train control house would be located at the south end of the Northern Connector where the storage tracks start to merge. This facility would be approximately 3,800 square feet in size and would house automatic train control equipment. The train control house would be approximately 126 feet long by 30 feet wide by 18 feet high.

- **Access Road.** A new 20 to 26-foot-wide paved road would extend along the east side of the storage tracks to a point just north of the current wetlands area. This extension of the planned road would extend from the East Storage Yard towards the northern transfer tracks. It would provide for both BART and fire and emergency access to the proposed Project area.

- **Relocation of Driving Range Fence.** Construction of the track for the Northern Mainline Connector would require the relocation of the boundary fence between the driving range and the BART tracks. The property is owned by BART, but the Hayward Area Recreation and Park District (HARD) has a permanent operating easement for the property for the operation of the driving range. The relocation would shift the boundary fence a maximum of approximately 50 feet to the east along about 1,310 feet (the full length of the driving range). Approximately 61,544 square feet (1.41 acre) of property would be affected. The boundary shift would require BART and HARD to extinguish a portion of the existing operating easement.

- **Wetland Mitigation Area.** Approximately 2.24 acres of HARD property south of the driving range is being considered for conversion to a permanent wetland area as mitigation for the loss of wetlands on-site. Development of wetlands would follow use of this area as the Secondary Staging Area during construction.

- **Train Wash**. A train wash facility would be constructed at the south end of the Northern Connector tracks, just north of the vehicle storage area. The train wash would allow BART to clean the exteriors of trains as they enter the storage yard following the completion of revenue service. The train wash would be approximately 200 feet long by 30 feet wide by 14 feet high.

- **Site Lighting.** Light poles for security lighting would be added along the new trackway. Light poles would be 15 to 18 feet high with shielded lamps. The new lights would not include motion detectors.

- **Perimeter Fence.** A 9-foot-high security fence would be provided along the new perimeter of the expansion area topped with razor coil adding 12 inches in height.

2.2 PROJECT ALTERNATIVES

This Section 4(f) analysis considers two alternatives for the HMC2 Project – the No Build Alternative and one Build Alternative to address fleet storage and maintenance requirements. Due to the presence of the existing BART mainline track and associated embankment, construction of the new embankment and trackway must occur from the east side of the project site (e.g., from the existing golf course driving range); therefore, there are no viable alternatives that would eliminate the temporary use of the golf course driving range. As the design progresses and construction details are further refined, BART will continue to coordinate with HARD to try to reduce temporary impacts during construction. A summary of the proposed project alternatives is provided below.

2.2.1 No Build Alternative

The No Build Alternative proposes no improvements within the project area. The HMC Yard would continue to operate as it currently does with no additional car storage capacity or connection from the BART mainline to the existing HMC Yard.

2.2.2 Build Alternative

The Build Alternative consists of the HMC2 Project as described in Section 2.1 above.

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3.0 REGULATORY FRAMEWORK

Section 4(f) of the Department of Transportation Act of 1966 (23 United States Code [U.S.C.] 138 and 49 U.S.C. 303) declares that "it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

Section 4(f) prohibits use of land from a publicly owned significant park, recreation area, or wildlife and waterfowl refuge, and historic sites only if:

1. There is no prudent and feasible alternative to using that land; and

2. The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Section 4(f) further requires consultation with the Department of the Interior and, as appropriate, the involved offices of the Department of Agriculture and the Department of Housing and Urban Development in developing transportation projects and programs that use lands protected by Section 4(f). If historic sites are involved, then coordination with the State Historic Preservation Officer (SHPO) is also needed.

Coordination with the Department of Agricultural and Department of Housing and Urban Development is not required for the project because there would be no impacts to National Forest System lands or federal funding from the Department of Housing and Urban Development. Because historic sites are not involved, coordination with the State Historic Preservation Officer is not needed.

3.1 DETERMINING SECTION 4(F) RESOURCES

Section 4(f) applies when the U.S. Department of Transportation agency approves a transportation project that uses Section 4(f) property, and the following four conditions are true:

1. The project must require approval from FTA in order to proceed

2. The project must be a transportation project

3. The project requires use of land from property protected by Section 4(f); and

4. None of the regulatory applicability rules or exceptions apply.

Section 4(f) properties include:

- Publicly Owned Public Parks, Recreational Areas, or Wildlife or Waterfowl Refuges open to the public.

- Historic sites of national, state or local significance in public or private ownership regardless of whether they are open to the public. Section 4(f) also applies to historic sites listed or eligible for inclusion in the National Register of Historic Places.

3.2 SECTION 4(F) USE

As defined in 23 Code of Federal Regulations (CFR) 774.17, a "use" of a protected resource occurs when any of the following conditions are met:

- Direct Use: Land is permanently incorporated into a transportation facility.
- Temporary Use: There is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose as determined by the criteria in 23 CFR 774.13(d).
- Constructive Use: There is a constructive use of a Section 4(f) property as determined by the criteria in 23 CFR 774.15.

3.2.1 Direct Use

A direct use of a Section 4(f) resource takes place when part or all of the property designated for protection under Section 4(f) is permanently incorporated into a transportation project (23 CFR Section 774.17). This may occur as a result of partial or full acquisition of a fee simple interest, permanent easements, or temporary easements that exceed the regulatory limits noted below (23 CFR Section 771.135).

3.2.2 Temporary Use

A temporary use of a Section 4(f) property occurs when there is temporary occupancy of a protected property for construction-related activities and when that temporary occupancy is considered adverse in terms of the preservationist purposes of the Section 4(f) statute.

If the following five conditions set forth in 23 CFR Section 774.13(d) can be satisfied, Section 4(f) does not apply.

1. The duration of the occupancy must be temporary (i.e., shorter than the period of construction) and does not involve a change in ownership of the property.
2. The scope of the work must be minor, with only minimal changes to the protected resource.
3. There are no anticipated permanent adverse physical impacts on the protected resource and no temporary or permanent interference with the activities or purpose of the resource.
4. The land being used must be fully restored to a condition that at least equals the condition that existed prior to the proposed project.
5. There must be documented agreement by the appropriate officials having jurisdiction over the Section 4(f) resource regarding the above conditions.

3.2.3 Constructive Use

A constructive use of a Section 4(f) resource happens when a transportation project does not permanently incorporate land from the resource in the transportation facility, but the proximity of the project to the Section 4(f) property results in adverse proximity impacts (i.e., noise, vibration, visual, access, and/or ecological impacts). For a constructive use to occur, these impacts must be so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired (23 CFR Section 774.15).

Substantial impairment occurs only if the protected activities, features, or attributes of the Section 4(f) property are substantially diminished by the indirect adverse impacts of the project (23 CFR Section 774.15(a)). This determination is made through the following process:

- Identification of the current activities, features, or attributes of the resource that may be sensitive to proximity impacts
- Analysis of the potential proximity impacts of the project on the resource
- Consultation with the appropriate officials having jurisdiction over the resource (23 CFR Section 774.15(d)).

3.3 DE MINIMIS IMPACT DETERMINATION

3.3.1 Determining *De Minimis* Impacts to Section 4(f) Resources

A *de minimis* impact to a Section 4(f) resource is a nominal impact that would not be adverse to the activities, features, or attributes of the Section 4(f) resource. A *de minimis* impact finding can be made for some direct uses and temporary uses; however, a *de minimis* impact finding cannot be made for constructive uses.

Under federal regulations (23 CFR Section 774.13(d)), various exceptions to the requirement for Section 4(f) approval have been identified. These exceptions include temporary occupancies of land (e.g., temporary construction easements [TCEs] and other temporary project activities) that are so minimal as to not constitute a "use" under Section 4(f), provided that they do not exceed the five thresholds discussed above in Section 3.2.2.

Under Section 4(f), *de minimis* impacts to historic resources would be either no impact to the property or a finding of "no adverse effect" under 36 CFR Part 800. For other Section 4(f) protected resources, including publicly owned parks, recreational areas, and wildlife and waterfowl refuges, *de minimis* impacts would be defined as those impacts that do not adversely affect the activities, features, or attributes of the Section 4(f) resource.

The *de minimis* impact finding is based on the level of impact, including any avoidance, minimization, and mitigation or enhancement measures that are included in the project to address the Section 4(f) use. *De minimis* impact findings are expressly conditioned upon the implementation of measures that are relied on to reduce the impact to a *de minimis* level.

To reach a *de minimis* impact finding for properties where a use would occur, the official(s) with jurisdiction over the Section 4(f) resource must provide written concurrence) that the project would not adversely affect the activities, features, or attributes that qualify the property for protection under Section 4(f). In addition, the public must be afforded the opportunity to review and comment on the effects of the project on the identified Section 4(f) resource(s).

3.3.2 Coordination and Concurrence on De Minimis Findings

As discussed above, the regulations require coordination with officials that have jurisdiction over park and historic resources that may be used by the project prior to the approval of Section 4(f) impact findings. Regulations require written concurrence from these officials prior to:

- Making *de minimis* impact findings
- Applying an exception for temporary occupancies
- Applying an exception for transportation enhancement and mitigation activities

For parks, recreational areas, and wildlife and waterfowl refuges, the officials with jurisdiction over the property must be informed of the intent to make a *de minimis* impact determination, after which an opportunity for public review and comment must be provided.

3.4 SECTION 6(F) RESOURCES

In addition to resources protected under Section 4(f), this project is also required to analyze potential impacts to properties protected or enhanced with Land and Water Conservation Fund (LWCF) grants. Section 6(f)(3) of the LWCF Act (16 U.S.C. Section 4601-4) contains provisions to protect federal investments in park and recreational resources and the quality of those resources. State and local governments often obtain grants through the LWCF Act to acquire or make improvements to parks and recreational areas. Section 6(f) of the LWCF Act prohibits the conversion of property acquired or developed with LWCF grants to a non-recreational purpose without the approval of the Department of Interior's National Park Service. Section 6(f) further directs DOI to assure that replacement lands of equal value, location, and usefulness are provided as conditions to such conversions. Consequently, where conversion of Section 6(f) lands is proposed for roadway and highway projects, replacements will be necessary.

To determine whether LWCF funds were involved in the acquisition or improvement of Section 4(f) resources, the Land and Water Conservation Fund (LWCF) project map[1] was reviewed to identify any LWCF-funded parks in the project vicinity. This research revealed that no LWCF funds were utilized for improvements at any sites within 0.5 mile of the proposed project. This finding was confirmed by Michael Williams, Senior Bond Project Manager at HARD via an email to BART on June 24, 2021. Therefore, there would be no effect on LWCF-funded parks or recreational resources.

[1] Trust for Public Land. 2021. Land and Water Conservation Fund Project Map website: lwcfcoalition.org/map (accessed October 5, 2021).

4.0 DESCRIPTION OF SECTION 4(F) RESOURCES

4.1 IDENTIFICATION OF SECTION 4(F) RESOURCES

As noted above, resources subject to Section 4(f) consideration include publicly owned lands such as public parks; recreational areas of national, state, or local significance; wildlife and waterfowl refuges; and historic sites of national, state, or local significance.

Resources in the project study area were identified if they were:

- Existing publicly owned recreational and park resources, including local, regional, and State resources;
- Publicly owned wildlife and waterfowl refuges and conservation areas;
- Existing public bicycle, pedestrian, and equestrian trails; or
- National Register of Historic Places (NRHP) listed or eligible historic sites.

Research was conducted to identify publicly owned parks, recreational areas, wildlife and waterfowl refuges, and land from a historic site within 0.5 mile of the project alternatives. Based on this research, there are twelve properties within 0.5 mile of the project corridor that qualify as Section 4(f) resources, including 7 parks/recreational facilities, 1 existing multi-use path, and 4 schools with publicly accessible facilities. Based on the results of the cultural resources study,[5] no historic properties or archaeological sites are located within 0.5 mile of the project alternatives. As stated previously, no Section 6(f) resources exist within the project study area.

A summary of the number of identified resources is provided in Table A and shown on Figure 6.

Table A: Summary of Properties Subject to Section 4(f) Consideration

Type of Property	Geographic Location to Project	Number of Properties Identified
Public Parks	Within 0.5 mile	7
Public Schools with Recreational Areas	Within 0.5 mile	4
Trails	Within 0.5 mile	1
Wildlife and Waterfowl Refuges	Within 0.5 mile	0
NRHP Listed or Eligible Historic Properties	Within 0.5 mile	0
NRHP Listed or Eligible Archaeological Resources	Within 0.5 mile	0

Source: LSA 2021

[5] LSA. 2022a. *BART Hayward Maintenance Complex Phase 2 Project – Supplemental Cultural Resources Study.* May.

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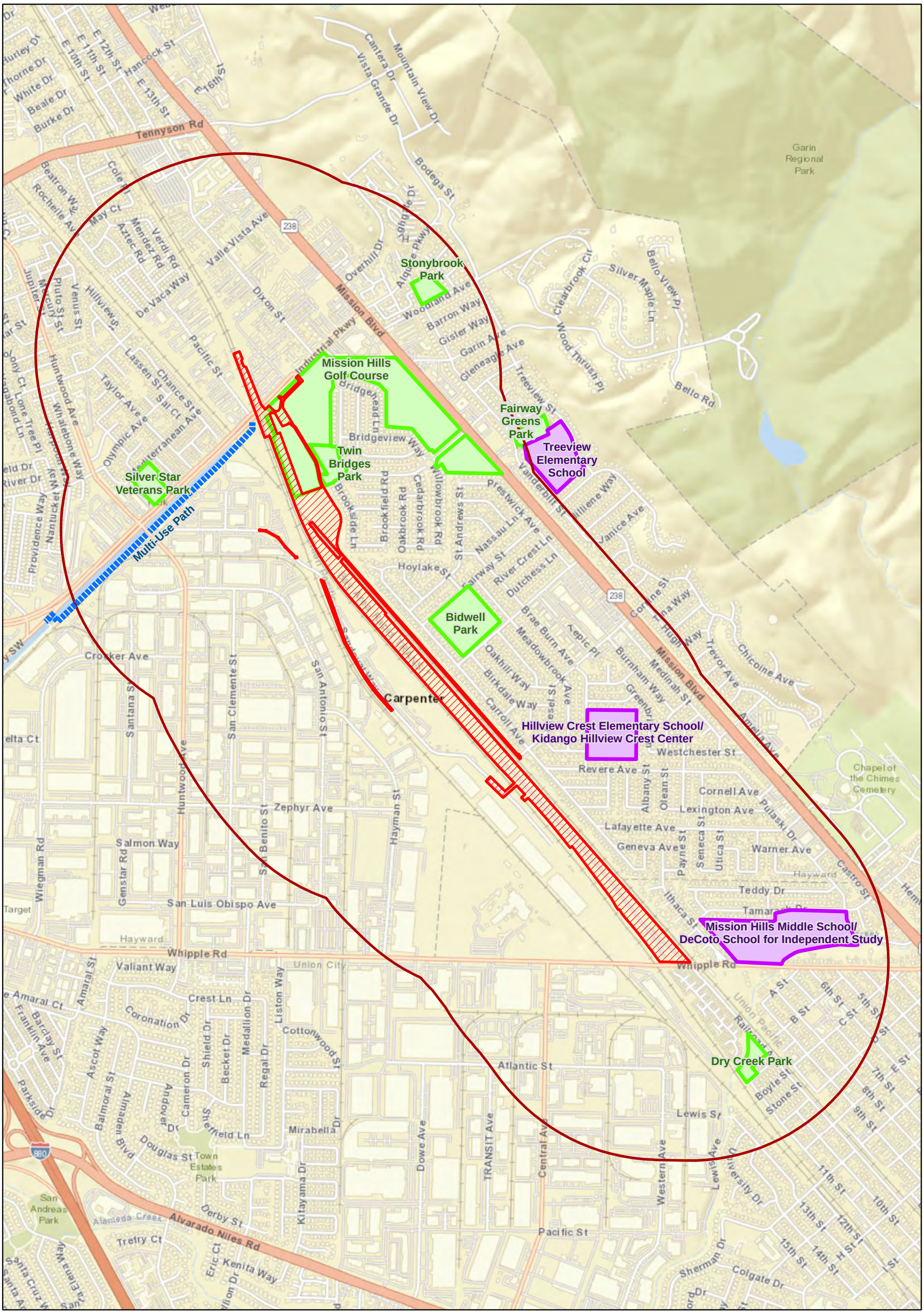

LSA

LEGEND

- Project Site
- 0.5-mile Buffer of Project Site
- School
- Park
- Trail

0 600 1200
FEET

SOURCE: Esri World Street Map (2021).

I:\WRO2001\GIS\Maps\Section 4(f)\Figure 6_Section 4(f) Properties in the Vicinity of the Project Site.mxd (10/15/2021)

FIGURE 6

BART HMC2 Project Section 4(f) Evaluation

Section 4(f) Properties in the Vicinity of the Project Site

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4.2 PUBLIC PARKS AND RECREATION FACILITIES

Twelve publicly owned lands that contain parks and recreational areas are within 0.5 mile of the project site, as shown in Figure 6. Of these 12 properties, 4 are public schools with outdoor playgrounds and other recreational facilities, which are assumed to be open to the general public. Seven properties are outdoor parks and recreational areas (e.g., public golf course). In addition, one multi-use path is located within 0.5-mile of the project site. Table B provides a summary of all 12 properties by type (i.e., school and park), including information on location, ownership, facilities available at each property, and whether the property is subject to Section 4(f) protection.

Table B: Public Parks and Recreation Facilities within the Section 4(f) Study Area

Property Name	Location	Current Ownership	Facilities	Subject to Section 4(f)?
Schools				
Treeview Elementary School	30565 Treeview St. Hayward, CA 94544	Hayward Unified School District	Playground Soccer Field Open Lawn Area Basketball Courts	Yes
Hillview Crest Elementary School/Kidango Hillview Crest Center	31410 Wheelon Ave., Hayward CA, 94544	New Haven Unified School District	Open Lawn Area Playground Basketball Courts Four Square	Yes
Mission Hills Middle School	250 Tamarack Dr. Union City, CA 94587	Mission Hills Middle School	Baseball/ Softball Open Field Playground Basketball Courts	Yes
DeCoto School for Independent Study	725 Whipple Rd. Union City, CA 94587	New Haven Unified School District	Track Baseball/ Softball Open Field	Yes
Parks				
Twin Bridges Park	301 Arrowhead Way Hayward, CA 94541	Hayward Area Recreation and Park District	Barbecues Basketball Court Open Lawn Area Picnic Tables Playground	Yes
Bidwell Park	175 Fairway Hayward, CA 94541	Hayward Area Recreation and Park District	Barbecues Baseball / Softball Horseshoe Courts Open Lawn Area Picnic Tables Playground Soccer Volleyball	Yes
Silver Star Veterans Park	695 Industrial Parkway Hayward, CA 94544	Hayward Area Recreation and Park District	Playground Barbecues Picnic tables Basketball Courts Open Lawn Area	Yes
Mission Hills of Hayward Golf Course	275 Industrial Parkway W Hayward, CA 94541	Hayward Area Recreation and Park District	9 Hole Golf Course Driving Range Restaurant & Bar	Yes

Table B: Public Parks and Recreation Facilities within the Section 4(f) Study Area

Property Name	Location	Current Ownership	Facilities	Subject to Section 4(f)?
Fairway Greens Park	30504 Vanderbilt St. Hayward, C 94541	Hayward Area Recreation and Park District	Barbecues Picnic Tables Trails	Yes
Stonybrook Park	620 Woodland Dr, Hayward, CA 94544	Hayward Area Recreation and Park District	Barbecues Nature Center Open Lawn Area Parking Picnic Tables Restrooms	Yes
Dry Creek Park	1001 Westgard St, Union City, CA 94587	City of Union City	Picnic Area Open Lawn Area Playgrounds	Yes
Trails				
Multi-Use Path	Industrial Parkway	City of Hayward	Multi-Use Path	Yes

Source: LSA 2021

4.3 WILDLIFE AND WATERFOWL REFUGES

As described above, no wildlife and waterfowl refuges were identified within the Biological Study Area or within 0.5-mile of the project site.

4.4 HISTORIC AND ARCHAEOLOGICAL SITES

The study area for historic sites is the Area of Potential Effects (APE) developed for this project in accordance with 36 CFR 800.4(a)(1). The APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, including archaeological sites. Direct effects include physical changes to historic properties and visual effects or effects caused by noise or vibration. The proposed APE also incorporates areas that could be affected by the extent of project-related ground disturbance. Cultural resources specialists reviewed local historic landmark inventories and archaeological records, conducted background research, and performed field surveys of the project's APE as described in the Cultural Resources Study[6] and the Supplemental Cultural Resources Study.[7] No known and previously recorded cultural resources are located in or adjacent to the APE, nor did the field survey identify any cultural resources within the APE. Historic-period maps and aerial photographs indicate that the APE was undeveloped and mostly agricultural use; therefore, it is unlikely that any historic-period archaeological deposits are located within the APE, and no historic properties or archaeological sites were identified within 0.5-mile of the project site.

6 LSA. 2021. *BART Hayward Maintenance Complex Phase 2 Project –Cultural Resources Study*. March.
7 LSA. 2022a. op. cit.

5.0 IMPACTS ON SECTION 4(F) PROPERTIES

This section describes which Section 4(f) resources may be affected if the proposed project is implemented. Although not discussed in detail in this chapter, every Section 4(f) resource within the study area was analyzed for potential direct and indirect impacts under both alternatives. Of the twelve public parks and recreational facilities discussed in Chapter 4, potential impacts are discussed in this evaluation for only one property where impacts are anticipated under the Build Alternative. Additional analysis follows for this resource. An assessment has been made as to whether any permanent or temporary occupation of the property would occur, and whether the proximity of the project would cause any access, visual, air quality, noise, vibration, biological, or water quality effects that would substantially impair the features or attributes that qualify the resource for protection under Section 4(f).

The analysis of potential effects on Section 4(f) resources that follows includes discussion of how the proposed project would affect this Section 4(f) resource and whether the effects would result in a use of the resource.

5.1 POTENTIAL SECTION 4(F) USES BY THE NO BUILD ALTERNATIVE

There would be no uses of park, recreational, or historic resources subject to Section 4(f) provisions with the No Build Alternative.

5.2 POTENTIAL SECTION 4(F) USES BY THE BUILD ALTERNATIVE

The following section describes the potential Section 4(f) uses for the Build Alternative. In summary, the Build Alternative would require direct use and temporary use of one Section 4(f) resource – the Mission Hills of Hayward Golf Course. No direct use, temporary use, or constructive use of any other Section 4(f) resources would be required for the Build Alternative.

5.2.1 Mission Hills of Hayward Golf Course

5.2.1.1 Description of Mission Hills of Hayward Golf Course

The 58-acre Mission Hills of Hayward Golf Course, which is owned by the Hayward Area Recreation and Park District (HARD), is located immediately between existing BART property and Mission Boulevard in the City of Hayward. HARD is an independent special use district created to provide park and recreation services for over 280,000 residents. HARD's boundaries encompass a 100 square-mile area, which includes the City of Hayward and the unincorporated communities of Castro Valley, San Lorenzo, Ashland, Cherryland, and Fairview. HARD's park system includes some 104 sites covering 1,357 acres. The system includes local and community parks, school recreation sites, aquatic centers, golf courses, and other special facilities as diverse as the Hayward Shoreline Interpretive Center, Hayward Japanese Gardens, The Douglas Morrison Theater, Sulphur Creek Nature Center, and the Rowell Ranch Rodeo Park.[8]

[8] Hayward Recreation and Park District. 2019. Hayward Recreation and Park District Parks Master Plan. October.

The Mission Hills of Hayward Golf Course includes a 9-hole golf course, double-decker driving range, two practice putting greens, three green chipping areas, a pro shop, and café. The Mission Hills of Hayward Golf Course is located immediately adjacent to the project site, in particular, the driving range, which runs along the northeastern boundary of the site. The golf course is open from 8:00 a.m. to 4:00 p.m. daily. The driving range is open from 7:00 a.m. to 10:00 p.m. in the spring/summer and from 7:00 a.m. to 9:00 p.m. in the fall/winter. In addition, the golf course property includes approximately 3 acres of undeveloped open space land located to the south of the existing driving range. HARD has historically used this area for various purposes and has considered various other uses of the land.

As described in HARD's Parks Master Plan,[9] HARD has recently implemented a project to renovate the driving range, including the replacement of the synthetic turf surfacing and vertical mesh netting and conversion of the existing lighting to energy-saving LED light fixtures. In addition, improvements have been made to the golf course, including rehabilitation of the existing well, addition of new solar panels, and installation of new LED lights in the golf course parking lot.

A portion of the existing driving range is located on BART-owned property; however, HARD has a permanent operating easement that allows for operation of the driving range.

5.2.1.2 Project Effects at Mission Hills of Hayward Golf Course

The effects of the Build Alternative (HMC2 Project) on the Mission Hills of Hayward Golf Course are described below.

Direct Use. Construction of the track for the Northern Mainline Connector would require the relocation of the boundary fence between HARD's driving range and BART. The boundary fence consists of black safety netting strung between steel poles that extend approximately 120 feet above ground level. The relocation would shift the boundary fence a maximum of approximately 50 feet to the east along 1,310 feet (the full length of the driving range). Approximately 61,544 square feet (1.41 acres) of property would be affected. The boundary shift would require BART and HARD to extinguish a portion of the existing operating easement. Figure 7 shows the portion of the current easement area that would be extinguished by BART.

The 61,544-square foot easement area formerly granted to HARD from BART would have to be extinguished. The area represents approximately 9.5 percent of the driving range's pre-project acreage and 2.4 percent of the overall acreage of the Mission Hills of Hayward Golf Course facility, which would be permanently removed from this recreation use.

The direct use area described above would not adversely affect any of the recreational activities, features, or attributes within the existing golf course. Although the acquisition area would minimally reduce the overall size of the driving range, it would not inhibit existing recreational activities within the golf course/driving range. The reduction in area of the driving range would not change the number of users the driving range can accommodate or the hours the driving range can operate.

[9] Hayward Recreation and Park District. 2019. op. cit.

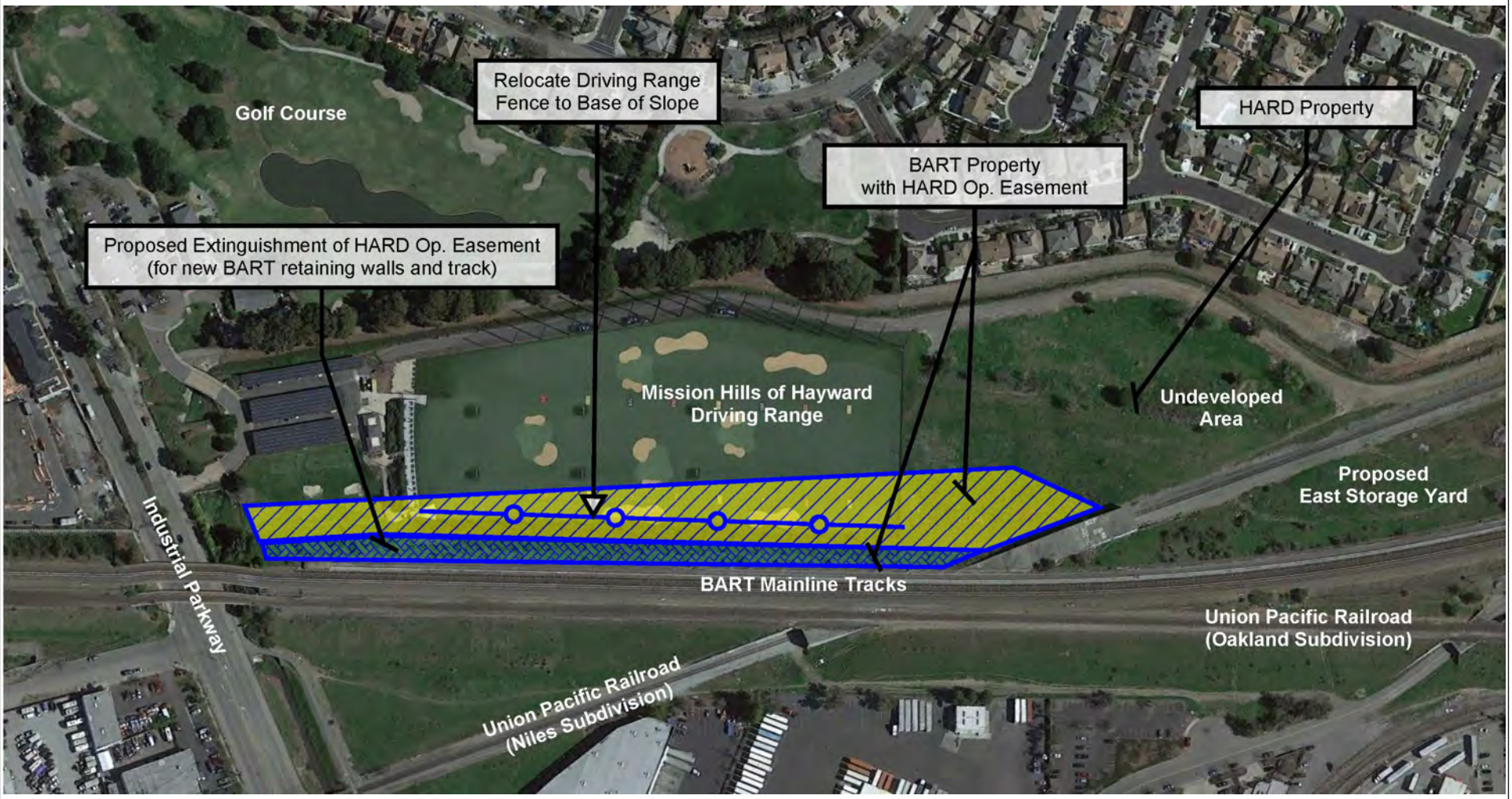

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FIGURE 7

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SOURCE: San Francisco Bay Area Rapid Transit District, 2021

BART HMC2 Project Section 4(f) Evaluation
Permanent Acquisition Areas

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In addition, as outlined in Section 2.0, Project Description, approximately 2.24 acres of the undeveloped open space area south of the driving range is being considered for conversion to a permanent wetland area as mitigation for the loss of wetlands associated with development of the HMC2 Project. This open space area is owned by HARD as part of the Mission Hills of Hayward Golf Course and has historically been used by HARD for various purposes and has been considered for various other uses. It is not currently accessible by or open to the public, used for recreation purposes, or developed with recreation facilities. Conversion of this area to permanent wetland would entail establishment of a conservation easement over this portion of HARD's property, to preserve the created wetlands in perpetuity. BART would provide HARD compensation for any permanent impacts. The details of the proposed compensation would be negotiated as part of real estate negotiations between the two agencies. Figure 8 shows the proposed wetland mitigation concept.

Because this portion of the HARD property is not currently open to the public for recreation use, its direct use would not adversely affect any of the recreational activities, features or attributes within the existing golf course. Although the acquisition area would minimally reduce the overall size of the HARD property (approximately 4 percent of the total 58 acres), it would not inhibit existing recreational activities within the golf course/driving range. Additionally, the demand analysis conducted for HARD's Parks Master Plan did not identify a need for additional golf courses within HARD's service area; therefore, it is unlikely that this undeveloped area would be developed in the future for expansion of the golf course. The Parks Master Plan indicates that HARD has considered development of this undeveloped site as a corporation yard; however, the site lacks the necessary utility connections.[10]

In total, the proposed project would result in the direct use of 3.65 acres of the 58-acre golf course property (approximately 6.2 percent) owned and/or operated by HARD as a public recreation facility. As described above, the use of a portion of the existing driving range would minimally reduce the overall size of the driving range; it would not inhibit existing recreational activities within the golf course/driving range. The use of the undeveloped area south of the existing driving range would not affect existing recreation facilities as this area is not currently open to the public for recreation use.

Temporary Use. Construction of the embankment, retaining wall, and trackway for the Northern Mainline Connector would require a temporary construction easement and staging area adjacent to the current BART embankment. Figure 9 illustrates the two staging locations: one on the HARD driving range immediately adjacent to the existing trackway, and the second on undeveloped HARD property just south of the driving range. Construction access would be required from Industrial Parkway and the driving range parking lot and service road. Construction access would also require the temporary removal of the solar panels in the eastern portion of the driving range parking lot to provide the space for a safe path for large trucks. Typical vehicles would include pickup trucks, cement trucks, and semi-trucks. Truck traffic estimated to be approximately 12 trucks per day.

10 Hayward Recreation and Park District. 2019. op. cit.

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FIGURE 8

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SOURCE: San Francisco Bay Area Rapid Transit District, 2021

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BART HMC2 Project Section 4(f) Evaluation
Proposed Wetland Mitigation Approach

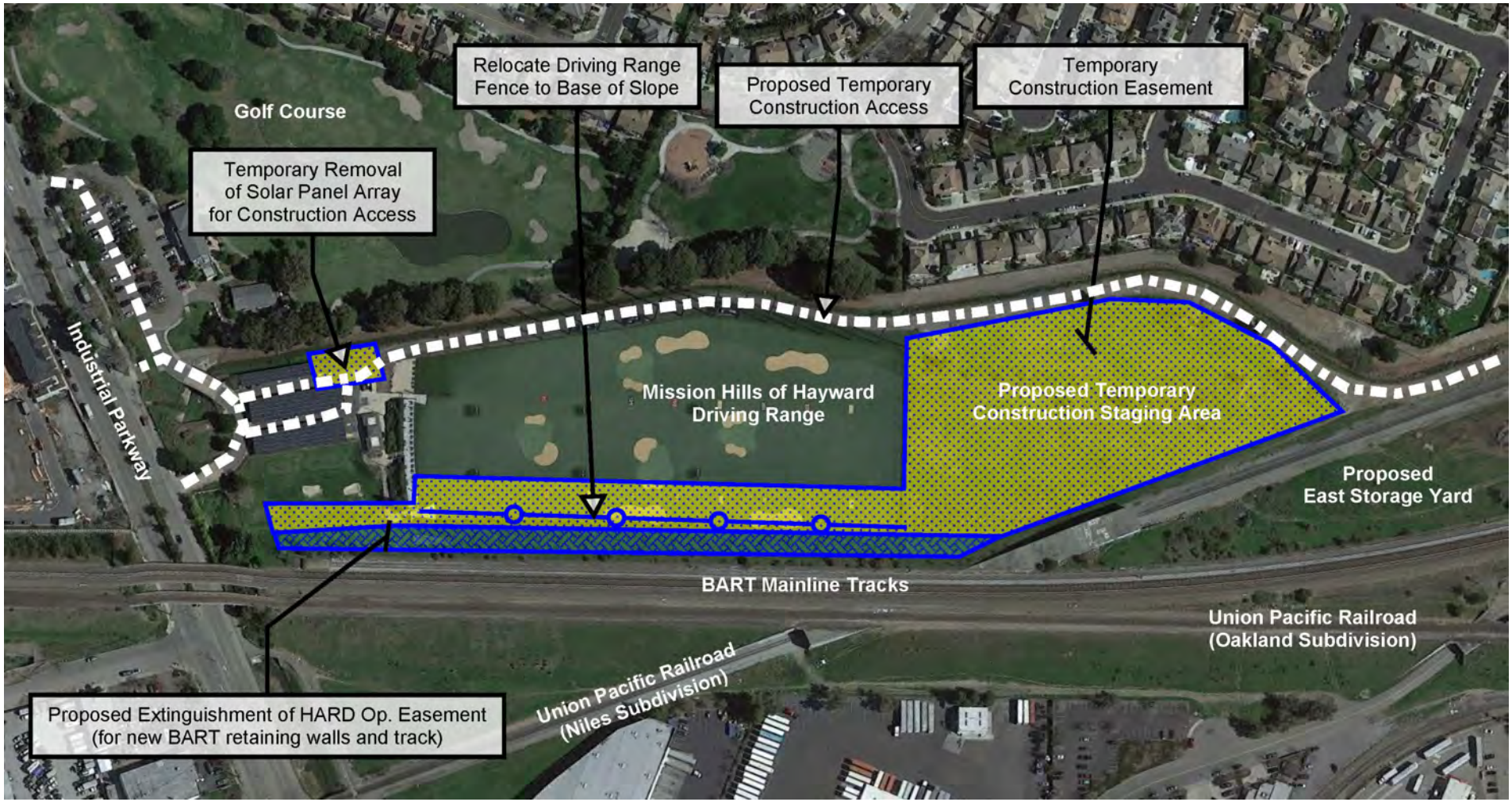

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FIGURE 9

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SOURCE: San Francisco Bay Area Rapid Transit District, 2021

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BART HMC2 Project Section 4(f) Evaluation
Temporary Acquisition Areas

Following construction, the driving range would be restored with a relocated western fence, turf replaced, and solar panels reinstalled. As part of real estate negotiations, BART will coordinate with HARD regarding potential compensation for loss of revenue and temporary impacts associated with the closure of the driving range during construction.

Access to the golf course, pro shop and restaurant would be retained throughout the construction period. However, the driving range would be out of operation for approximately 14 months. The downtime is only an estimate and may change once final design is initiated. Prior to the proposed closure, notices would be provided to inform the public of the dates, times, and duration of the proposed closure. BART would coordinate with HARD regarding the appropriate methods for notifying the public; however, it is anticipated that notification would include, but not be limited to, a notice posted at the golf course clubhouse, and posted updates on the HARD website. The public would be directed to other nearby driving range facilities including the Fremont Park Golf Course, approximately 8 miles to the south, the Pleasanton Golf Center, approximately 18 miles to the east, and the Monarch Bay Golf Club, approximately 11 miles to the north.

Following project construction, the driving range would be fully available for public use - the "activities, features, and attributes" of the public driving range, a Section 4(f) resource, would not be adversely affected. Similarly, temporary use of the undeveloped area south of the driving range for construction staging would not affect recreation use as this area is not current developed with recreation facilities. Work associated with the temporary occupancy would be minor in scope, and there are no anticipated permanent adverse physical effects or other interference with the activities or purpose of the resource.

Constructive Use. The Build Alternative would not result in a constructive use of Mission Hills of Hayward Golf Course. An indirect impact would be considered a constructive use under Section 4(f) if the impact were so severe that the public did not have access to the park and/or recreational activities occurring within the park were severely affected by the project's impacts. Potential indirect impacts related to the Build Alternative are discussed below.

Accessibility. Vehicular and pedestrian access to the Mission Hills of Hayward Golf Course would be maintained at all times during construction and operation of the Build Alternative. As described above, construction vehicles would access proposed staging areas via Industrial Parkway and the golf course parking lot; however, the parking area would remain open throughout the construction period. Sidewalks and bicycle routes along Industrial Parkway would remain accessible throughout the construction period.

Visual. Visual impacts during construction would be typical of construction projects, including construction fencing, construction equipment, material stockpiles, and vegetation removal, which would temporarily affect the existing landscape aesthetic of the Mission Hills of Hayward Golf Course. Temporarily disturbed areas would be returned to pre-project conditions once construction is completed; therefore, the minor visual changes associated with the Build Alternative would not be considered a Section 4(f) constructive use.

Noise and Vibration. Indirect noise and vibration impacts associated with the Build Alternative are not expected to result in a constructive use of the Mission Hills of Hayward Golf Course.

According to the Noise and Vibration Impact Assessment,[11] no vibration impacts are anticipated at any of the sensitive receptors of the proposed project. The installation of a crossover north in Industrial Parkway would result in a significant noise impact for multi-family residential uses located adjacent to the proposed Northern Mainline Connector; however, as described in Section 2.1.2, a 600-foot long, 10-foot high sound wall (5 feet above top of rail) would be constructed along the east side the Northern Connector tracks north of Industrial Parkway to reduce noise generated by nearby crossovers. With implementation of the proposed sound wall, no noise or vibration impacts resulting from the proposed project operations are anticipated.

During construction, the project would generate noise and vibration impacts typical of construction activities and from using construction equipment and vehicles. Best Management Practices (BMPs) would be incorporated to minimize these short-term, temporary impacts. These include vibration monitoring by the contractor and having a plan in place before construction begins for the use of alternative equipment and techniques when established thresholds may be exceeded (see Section 6.1.1). The incremental increase in noise and vibration impacts during construction, and once the proposed project is in operation, would not inhibit the existing functions of, or activities at the Mission Hills of Hayward Golf Course. The proposed project would not result in a Section 4(f) constructive use of this resource to indirect noise and vibration impacts.

Air Quality. Indirect air quality impacts as a result of the Build Alternative are not expected to result in a constructive use of Mission Hills of Hayward Golf Course. As discussed in the project's Air Quality Study,[12] the Mission Hills of Hayward Golf Course is currently subject to indirect air quality impacts due to its proximity to Industrial Parkway and Mission Boulevard, and due to its location in a built-out urban environment. The incremental increase air quality impacts during construction and once the proposed project is in operation would not inhibit existing recreational functions in the Mission Hills of Hayward Golf Course that are already subject to air emissions. Further, BMPs would be incorporated to minimize short-term, temporary construction-related air emissions (see Section 6.1.1). The proposed project would not result in a Section 4(f) constructive use of the Mission Hills of Hayward Golf Course due to indirect air quality impacts.

Vegetation and Wildlife. The Mission Hills of Hayward Golf Course is located in a built-out urban area; there are no wildlife corridors or substantial vegetation communities adjacent to the golf course that would be indirectly impacted by the project; therefore, there would be no vegetation or wildlife impacts at the Mission Hills of Hayward Golf Course resulting in a Section 4(f) constructive use.

Water Quality. The Build Alternative would have potential short-term water quality impacts during grading and excavation activities as well as from uncovered or improperly covered stockpiles, unstabilized slopes, construction staging areas, unmaintained construction

[11] LSA. 2022b. *Noise and Vibration Impact Assessment, BART Hayward Maintenance Complex Phase 2 Project.* June.

[12] LSA. 2022c. *San Francisco Bay Area Rapid Transit (BART) Hayward Maintenance Complex – Phase 2 (HMC2) Project. Air Quality Impact Analysis*. June.

equipment, and accidental spills of fuels, oils, and other potentially toxic materials. Similarly, operation of the Build Alternative has the potential to affect water quality. Operation of the proposed Project components would result in the storage and use of cleaning compounds, corrosives, metals, adhesives, and solvents used to wash interiors and equipment. Release of these types of substances could enter the stormwater sewer system or local drainages in the event of a spill or leaking container. However, with minimization measures, short- and long-term water quality impacts associated with the Build Alternative would not substantially impair the activities, features, and/or attributes that qualify the Mission Hills of Hayward Golf Course for protection under Section 4(f).

5.2.1.4 Applicability of Section 4(f)

The Build Alternative would result in direct and temporary use of the Mission Hills of Hayward Golf Course. No constructive use of this resource is anticipated under the Build Alternative.

The Build Alternative would require direct use of 1.41 acres (61,544 square feet) of the Mission Hills of Hayward Golf Course driving range in the form of an extinguishment of a portion of the existing operating easement, which represents 9.5 percent of the driving range's pre-project acreage and 2.4 percent of the overall acreage of the Mission Hills of Hayward Golf Course facility. The Build Alternative may also require direct use of an additional 2.24 acres of undeveloped open space land south of the existing driving range for conversion to a permanent wetland mitigation area. This undeveloped open space area is owned by HARD as part of the Mission Hills of Hayward Golf Course but is not currently open to the public or used for recreation purposes. BART would provide HARD compensation for any permanent impacts. The details of the proposed compensation would be negotiated as part of real estate negotiations between the two agencies With implementation of the identified mitigation measures, direct use of the driving range and HARD-owned property south of the driving range would constitute a *de minimus* impact to Section 4(f) resources.

In addition, the Build Alternative would result in temporary use of approximately 89,500 square feet of the existing driving range, as well as a 3-acre parcel of HARD-owned land located south of the driving range for construction staging. This temporary use would result in the temporary interference to existing driving range operations for approximately 14 months during project construction, it would not interfere with other operations at the existing golf course. There are no anticipated permanent adverse physical effects or other interference with the activities or purpose of the resource. Temporarily disturbed areas of the existing driving range would be fully restored to pre-project conditions once temporary impacts are complete and HARD would be compensated for the lost revenue of the driving range associated with the temporary closure. Therefore, the temporary use of the driving range and HARD-owned property south of the driving range would constitute a *de minimus* impact to Section 4(f) resources. As described above, a portion of the 3-acre parcel of undeveloped open space may be permanently converted to wetland following its use for construction staging; this direct use is described above.

5.2.1.5 Documentation of Consultation

BART staff have been meeting with HARD staff to plan the HMC2 Project in manner that would lead to the greatest public benefit but with the least disruption of ongoing operation of the Mission Hills of Hayward Golf Course. BART and HARD staff have discussed potential project impacts and

avoidance and minimization measures to be implemented during project operation and construction. Meetings and further correspondence between BART and HARD will continue to occur throughout the environmental review process. Formal consultation with HARD to confirm the *de minimis* finding will occur during public review of the Draft Supplemental IS/MND. Thereafter, correspondence with the official with jurisdiction over the Mission Hills of Hayward Golf Course will be added to Appendix A.

5.3 CONCLUSION

Based on the information presented above, the effects of the proposed improvements for the HMC2 Project constitute a *de minimis* impact and the requirements of 23 USC 138 and 149 USC 303 have been satisfied. This finding is considered valid unless new information is obtained, or the proposed effects change to the extent that a new analysis is needed.

6.0 AVOIDANCE, MINIMIZATION AND MITIGATION MEASURES

Several measures have been identified during development of the environmental studies to minimize potential impacts in the HMC2 Project area, including areas in which Section 4(f) properties are located, and are discussed in more detail in Section 6.1.1.

Planning efforts regarding reducing the size of parcel acquisition will continue during final design to refine the initial concept designs used in the environmental analysis with the expected outcome that HARD would concur that project plans would not result in an adverse effect to the Mission Hills of Hayward Golf Course. Concurrence by HARD will provide demonstrable evidence that harm to the Section 4(f) resources has been avoided and that the impacts would be *de minimis*.

Both common and property-specific measures to minimize harm to the Mission Hills of Hayward Golf Course are specified below. None of the effects under 36 CFR 800.5 are anticipated to be adverse, and a confirmation of that finding will be made with HARD, the official with jurisdiction, including revision to any minimization and mitigation measures proposed, as part of the consultation process. For the final environmental document, a HARD concurrence letter will be included as an appendix to the Section 4(f) Evaluation. The direct use and/or temporary occupancy of the Section 4(f) resource would be considered a *de minimis im*pact.

6.1 GENERAL MEASURES

Several measures have been identified during development of the technical studies and the Draft Supplemental IS/MND to minimize potential project impacts to Section 4(f) properties. These measures are summarized below.

6.1.1 Air Quality

- All work involving clearing, grubbing, grading, and fill transport associated with work on the project site north of Whipple Road shall not be conducted concurrently with construction work south of Whipple Road to assure that the BAAQMD nitrogen oxide (NOx) construction equipment emission threshold would not be exceeded.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day, or as necessary to control dust.

- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

- All vehicle speeds on unpaved roads shall be limited to 15 mph.

- All roadways, driveways, and sidewalks to be paved shall be completed as soon as practical.

- Building pads shall be laid as soon as practical after grading unless seeding or soil binders are used.

- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage stating the regulations shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

6.1.2 Noise and Vibration

- Where feasible, BART shall require that the contractor complies with a Performance Standard of 80 A-weighted decibels (dBA) 8-hour equivalent continuous sound level (L_{eq}) during the daytime (7 a.m. to 10 p.m.) and 70 dBA 8-hour L_{eq} during the nighttime (10 p.m. to 7 a.m.) at the property line of the sensitive receptor.

- Prior to construction, BART shall ensure that a Noise Control and Monitoring Report is prepared. The report shall include expected construction noise levels, noise control measures, and explain how the contractor intends to monitor and document construction noise and complaints.

- Locate noisy equipment as far as possible from noise sensitive receptors. In addition, the use of temporary barriers should be employed around the equipment.

- Where construction noise impacts have been identified, use temporary noise barriers along the working area and/or project right-of-way. Barriers/curtains must achieve a Sound Transmission Class (STC) of 30 or greater in accordance with American Society for Testing and Materials (ASTM) Test Method E90 and be constructed from material having a surface density of at least 4 pounds/square foot, to ensure adequate transmission loss.

- When nighttime or 24-hour construction will be required, coordinate with residents to ensure that the affected residents are fully informed about the upcoming construction. Residents will be given the option of sleeping in hotel rooms at BART expense for the duration of the nighttime construction in areas where construction is expected to exceed the FTA criterion. Residents that work nights and sleep days in locations where construction noise is expected to exceed the FTA criterion will be given the same option.

- Require ambient sensitive ("smart") backup alarms, SAE Class D, or limit to SAE Class C (97 dB) for vehicles over 2.5 cubic yards haulage capacity, or California Occupational Safety and Health

Act (Cal-OSHA)/Division of Occupational Safety and Health (DOSH)-approved methods that avoid backup alarm noise for vehicles under 2.5 cubic yards haulage capacity.

- Fit silencers to combustion engines. Ensure that equipment has effective, quality mufflers installed, in good working condition.
- Switch off engines or reduce to idle when not in use.
- Lubricate and maintain equipment regularly.
- Route construction-related truck traffic along roadways that result in the least disturbance to sensitive receptors.
- Comply with a Performance Standard of 0.3 in/sec peak particle velocity (PPV) at any building at any time.
- Minimize vibration annoyance by maintaining vibration levels at 80 vibration velocity decibels (VdB) or less at any building at any time.
- Prior to construction, BART shall prepare a Vibration Control and Monitoring Report, in which the contractor indicates what vibration levels they expect to generate, vibration control measures they intend to implement, and how they intend to monitor and document construction vibration and complaints.
- Avoid the use of impact pile drivers and use instead sonic or vibratory impact drivers. It is also encouraged that “quiet” or “silent” piling technologies be used, if feasible.
- When nighttime or 24-hour construction is necessary, coordinate with residents to ensure that the affected residents are fully informed about the upcoming construction. Residents will be given the option of sleeping in hotel rooms at BART expense for the duration of the nighttime construction in areas where construction is expected to exceed the FTA criterion. Residents that work nights and sleep days in locations where construction vibration is expected to exceed the FTA criterion will be given the same option.
- Monitor vibration during construction to ensure compliance with the criterion for building damage for buildings within 40 feet from construction activities. Conduct a pre-construction crack survey at these structures.
- Plan routes for hauling material out of the project site that would cause the least impact (annoyance).
- Restrict high amplitude vibration methods such as vibratory pile driving and soil compaction using large truck-mounted compactors to areas beyond 50 feet and 20 feet, respectively, of residential structures or wood-framed buildings. Otherwise, temporary accommodations away from construction shall be coordinated between BART and the residents.

6.2 PROPERTY-SPECIFIC MEASURES

- Following construction, the western fence will be relocated and reinstalled and the solar panels in the eastern portion of the driving range parking lot will be reinstalled. Any disturbed turf grass and landscaping not used by the project will be replaced to match pre-project conditions in consultation with HARD during and at the completion of construction. As part of real estate negotiations, BART will coordinate with HARD regarding potential compensation for loss of revenue associated with the closure of the driving range during construction.

- Construction of the track for the Northern Mainline Construction would require relocation of the boundary fence between the driving range and BART property. Approximately 1.14 acres (61,544 square feet) of property would be affected, requiring this portion of HARD's operating easement to be extinguished. The easement area to be extinguished would be re-purchased by BART.

- Following its use for constructing staging, 2.24 acres of the undeveloped area located south of the driving range is being considered for conversion to a permanent wetland area as mitigation for the loss of wetlands associated with development of the HMC2 Project. Conversion of this area to permanent wetland would entail establishment of a conservation easement over this portion of HARD's property, to preserve the created wetlands in perpetuity. BART would provide HARD compensation for any permanent impacts. The details of the proposed compensation would be negotiated as part of real estate negotiations between the two agencies.

7.0 REFERENCES

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